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APPLIED PSYCHOLOGY

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APPLIED PSYCHOLOGY

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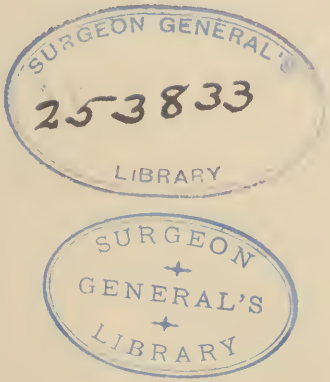

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PREFACE

The peculiarly ambiguous character of applied psychology at the present time makes it appropriate to preface this book with an explicit statement of its purpose. The current development of the subject shows two widely divergent tendencies. On the one hand we have, as the basis of practice, elaborate theory and experimental investigation, characterized by technique which is highly refined and to some extent unintelligible except to the specialist. This technique is exceedingly important for scientific procedure, but in general it lies beyond the immediate concerns of the interested public. The latter, on the other hand, obtains its conceptions of applied psychology from books, magazines, and lectures, which are distinctly popular, but which for the most part present little that is of practical value, since they lack the scientific foundation and formulation necessary to make their counsels reliable. Much of their doctrine is the exaggeration of trivialities, or what is worse, unhealthy superstition about the powers of the mind. Between these two tendencies there is a large gap. In other words, there is a lack of literature which attempts to present in a readable form the principles, methods, and results of scientific psychology as applied to problems of everyday life. It is this function which the present

volume endeavors in its own small way to perform.

The field covered by the subject is already large and is expanding rapidly, hence it has seemed best to limit the contents of the book to fundamental principles and the significant results attained in the three divisions of the field which have been most thoroughly explored, namely education, psychotherapy, and the psychology of industry, together with numerous illustrations drawn from other departments. The critical statement of principles is the most important part of the book, since it is by its misunderstanding of these that popular applied psychology usually goes astray. Throughout I have tried to keep the exposition as close as possible to common experience. Here psychology often succeeds only in giving precise form to what wise persons have long known, or reasons for what they have always done; but it is none the less desirable to have such exactitude and rationality scientifically established. This is perfectly genuine "applied psychology," though the fact is sometimes obscured in the atmosphere of experimental investigation.

There is special need of presenting simply and clearly the relation of psychology to medical practice. Quack psychotherapy is potentially if not actually a graver danger than the more familiar form of medical quackery. The popularizing of psychotherapeutic doctrines, religious and scientific, has led to a great deal of ignorant effort at application, occasionally with dire results. This danger can be met only by disseminating sound information

about the nature and limitations of psychotherapy. Any such attempt, however, at once faces the difficulty that the technique of psychotherapy is abstruse, and the further fact that to a great extent the material with which it deals is, except for professional purposes, unhealthy as a mental interest. Here again I have endeavored to keep the exposition on familiar ground, and to avoid the more repulsive aspects of mental disorder. This restricted presentation leaves large areas of the field untouched, but it nevertheless serves for the elucidation of principles. After all, what most of us need to know is how to regulate mental processes in relation to the minor ills of daily life, and how to escape the maleficence of charlatans who impose on ignorance.

The two most active foci of contemporary applied psychology are the Freudian concept of unconscious motivation and the scientific method of mental measurement. These subjects are unquestionably of great importance, yet I think there is danger of exaggerating them so that they obscure other significant principles, and in particular of ignoring the practical aspects and implications of the older psychology. For this reason they receive only a limited, and what will undoubtedly seem to some altogether too brief a discussion. This is all that the general plan of the book permits. The reader who desires a more extensive acquaintance with them can obtain it from special treatises.

The somewhat formidable batteries of questions appended to the chapters are designed not only to call attention to the principal points of the exposi-

tion, but also to serve as topics of further discussion. I venture to include them because students find them helpful in grasping the subject. Since, however, study so easily dissipates itself in an atmosphere of words, it is perhaps appropriate to remind the reader that the real aim of applied psychology is attained only in the actual application of it to the difficulties and problems of human experience. In this connection it is a pleasure to express my appreciation of the interest shown by students in the subject, and of their intelligence in applying it in their own lives.

BERNARD C. EWER.

Claremont, California, June 20, 1923.

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PART ONE

AIMS, PRINCIPLES, AND METHODS

APPLIED PSYCHOLOGY

CHAPTER I

THE AIMS OF APPLIED PSYCHOLOGY

Pure and Applied Science.—In many sciences a convenient distinction is drawn between their "pure" or theoretical and their "applied" or practical aspects, or in other words between the *abstract truth* and its *concrete application.* This distinction exists in mathematics, astronomy, physics, chemistry, sociology, economics, and other branches of learning. On the one hand we have investigations of the laws of nature and the record of human history, facts and principles as such, quite irrespective of any bearing which they may have upon human purposes. On the other hand there is a constant effort to meet the needs of life scientifically, that is to say by analyzing them in the light of abstract principles and thus controlling natural forces. In this way the mariner is enabled to sail the seas, the engineer to build bridges, the chemist to make dyes, and the teacher to direct the pupils' study. Sometimes these more distinctly practical efforts win independent names for themselves, as surveying, navigation, and pedagogy, and proceed to sail under their own colors. These are "applied sciences."

Strictly speaking, this term means the use of pure science in dealing with the affairs of actual life, the varied difficulties and problems of human experience. By a natural extension it signifies that part of pure science which is most useful for such purposes, and such is the meaning attached to it in this book. "Applied psychology" is the statement of those psychological principles which have value with reference to the practical interests of mankind. It includes also the experimental method of solving practical problems and an account of the results of application.

There is no sharp line of distinction between pure and applied science. Pure scientific knowledge is gained by the study of concrete facts, often of the most commonplace sort; and conversely the discovery of some abstract principle has led straightway to useful applications. Franklin investigated electricity with the aid of a kite, a key, and a bottle, but when the scientific concepts were formulated they were turned to amazingly practical account. Similarly the psychologist studies the laws of memory by learning "nonsense syllables," and thus enables the educator to modify school practice. Generally speaking, the competent investigator must have at least an appreciation of the practical problems of life which are related to his interest, and likewise the practitioner must be properly trained in theory, since otherwise he is apt to become a charlatan. Considered as truth these two aspects of science interpenetrate and blend.

The distinction lies in the motive quite as much as

in the content of learning. "Truth for truth's sake" may be contrasted with study for ulterior purposes, that is to say for the various aims of making a living, acquiring wealth, attaining power and material enjoyment. There is an instinct of curiosity which at times seeks simply to find the truth, just as there are other instincts which aim at safety, power, and possession. Here again, however, the antithesis grows slightly dim as we face the facts. The "pure scientist" ordinarily expects to earn his living through his specialty, frequently by teaching it to others; and likewise the skilful practitioner in any field does the thing as it should be done, not merely for wages, but because that is the right way of doing it. The standard of the right or ideal method applies to the most practical of tasks. Evidently the distinction is a somewhat elusive one; nevertheless it is commonly recognized, and it has played an important part in the history of science. For our present purpose it is sufficient to note that there are two kinds of scientific interest, differing to some extent in content and motive, but closely related to each other.

Let us observe the genetic aspect of the matter. The general course of evolution in science shows three phases. (a) It began when men were driven by the hardships of life to study the ways of nature and to devise clever means of attaining their ends. The fundamental occupations of hunting game, catching fish, tilling the soil, building houses, and fighting enemies led to highly intelligent practice, and so to knowledge as such. The essential impor-

tance of these tasks brought them into the sphere of religion, which not only furnished additional motives of a powerful sort for careful study, but also served to draw men's minds away from immediate objects to more obscure questions about nature at large, its forces and laws, and the origin and destiny of mankind. Primitive art and primitive superstition went hand in hand. They were not "science" in the strict meaning of the term, but they contained the seeds of real science. From them eventually came astronomy, physics, chemistry, and many another flourishing growth of human intelligence.

(b) In the long course of cultural development, practical interests gradually led to a more recondite and intellectually specialized kind of inquiry. Problems appeared which had no direct relation to everyday experience. The orbits of the heavenly bodies, the elementary constitution of material things, the essential activities of living matter, the processes of the mind, these and other subjects invited investigation on their own account. As was indicated above, there is a powerful instinct of curiosity in human nature, which is ordinarily subordinated to practical interest, but which may and in some individuals always does work strongly without regard to such interest. The history of science shows many a patient figure at work, sometimes under most discouraging conditions of poverty and persecution, persistently seeking the truth. The utility of the pursuit is not their concern. Doubtless their labors are glorified in their own minds by

some distant vision of humankind made better or wiser by the results of their toil, but the immediate dynamic of their passionate search for truth is simply the love of knowledge.

(c) This abstract learning is not the last word of science, however. The practical needs of life call incessantly for more intelligent treatment. Crude observation and rules of thumb prove inadequate; more exact knowledge and more effective methods are in demand. So the discoveries of the scientists are put to work in the solution of these practical problems, and human society makes material progress. Astronomical devices of apparatus and calculation enable the sailor to steer his course over the ocean; the laws of electricity operate through mechanisms of wonderful power and delicacy, carrying words and persons to their proper destinations; the chemist's wisdom gives us fabrics which are beautiful and foods which are pure—not to mention thousands of other benefits in the labor and enjoyment of everyday life.

Thus science begins with practical motives, develops an inquisitive passion for pure truth, and returns with this learning to the needs of life. The stages are not sharply distinct, of course. They interfuse at all points, as we have already seen. Theoretical knowledge is always susceptible of being turned to practical account, and on the other hand its application repeatedly opens new pathways of research. Yet surveyed as a whole the process of evolution in the domain of the intellect shows these distinguishable phases.

Pure and Applied Psychology.—In the case of psychology the distinction which we are considering is especially clear, both in its logical and in its historical character. With regard to the latter we may observe that the preliminary stage of development appeared when men tried to understand the reasons for other men's conduct, to divine the thoughts and feelings in their minds, and to govern themselves accordingly. The strange manifestations of insanity drew their attention to the mysterious cause of such behavior. Likewise a primitive tendency toward experimentation led them to fast or to intoxicate themselves in order to obtain marvelous visions and transports of emotion. In a philosophical way they constructed the hypothesis of a soul to account for these facts, and for others such as dreams and the solemn change from life to death. This was a pre-scientific kind of psychology, mostly of a practical sort. Crude as it was, it contained the germs of latter-day science in that it was an intelligent effort to ascertain the truth. Here, too, the power of religion as related to the needs of life gave it seriousness and dignity.

Even in this preliminary stage we may note a tendency toward abstract knowledge. Bits of wisdom about human nature crystallized in the form of moral proverbs; speculations about the soul ran beyond the immediate problems of practical life; observations of the illusoriness of the senses and the fallacies of opinion showed the theoretical function of the intellect at work, and constituted the beginning of pure science.

Gradually there came a time when this theorizing assumed a more systematic and thoroughgoing form. The nature of the mind, its laws of activity and its relation to physical behavior received abstract conceptual attention. Painstaking and penetrating analysis resulted in formal description and explanation. The definition and classification of sensations, the resolution of complex states of mind into their elementary components, the discovery of principles of perception, of memory and of imagination, the determination of the nature of emotion and will, —all this developed with only incidental and illustrative reference to practical affairs. Eventually these investigations were carried into the laboratory and pursued in technical form there, with the aid of apparatus, and usually with the effect of removing them altogether from the actual business of life. It is safe to say that many a college student has studied scientific psychology with hardly a suspicion that it had anything to do with the living interests of human beings,—that the laborious experiments upon reaction time, for example, had any reference to pulling a trigger, turning a steering wheel, or hitting a foul ball. That the psychology of feeling and attention bore upon one's casual scrutiny of the advertising cards in a street car or the precise location of machinery in a factory was equally unsuspected. Even where, as in certain classical writings, the psychologist maintained a constant illustrative contact with life, it too often happened that the student's enforced attention to abstract principles left the concrete facts virtually

out of sight. Still less did he attempt to regulate his own daily living by his scientific knowledge of the mind.

Yet the potency of application was implicit in the truth thus discovered, and occasionally writers took pains to make such application clear. There is no more genuine "applied psychology," for example, than is contained in Professor James' chapters on Habit, Memory, and Emotion. The process of education inevitably presented problems for the psychologist, and in one field of practical activity after another workers found themselves facing difficulties with which only the trained student of the mind could deal successfully. Psychology spread its tentacles over the schoolroom, the doctor's office, the store and factory, the clergyman's sanctum, even the court room. Sometimes in a careful and reliable way, sometimes with superficial haste and cheap pretense, the lore of the mind was applied to everyday affairs. Like other sciences, this one gained an independent status by exploring systematically the province of a certain kind of fact, by establishing its own descriptive and explanatory terminology, and by developing its own methods of investigation.

For several reasons the systematic development of applied psychology was long delayed. In the first place, as Münsterberg has pointed out, application deals with *individual* cases, whereas the seeker after scientific truth is expressly trying to discern *universal* characteristics. For example, the psychologist is interested in the facts of remembering and

forgetting in order to ascertain the laws of memory; the personal peculiarities of John Smith, except as they indirectly reveal the principles which he seeks, do not concern him. His aim is precisely in the opposite direction. Second, the methods of pure science have a technical perfection, an intellectual neatness and clearness, which are lost in the complexity of a practical problem. The laboratory investigator escapes the bother of irrelevant circumstances with which the practitioner is inevitably beset. Third, the history of science shows clearly that practical advance has often depended upon preliminary work of a theoretical sort. Engrossed in the latter, the student naturally felt that whatever utility his discoveries might possess would surely appear of itself. Fourth, the prevalence of much pseudo-psychological quackery cast a shadow of discredit athwart the path of applied psychology. Scholars had no desire to become mixed up with fortune-telling charlatans or superstitious believers in universal "mind cure."

For these reasons scientific psychology failed until recently to play a large part in the regulation and advancement of human affairs. Once started in a dignified manner, however, it quickly gathered momentum and pushed its way into various fields of activity. In this as in other departments of learning there persists a certain contemptuous antagonism between the representatives of pure science and their more practically-minded brethren, but this will be outgrown as applied psychology realizes its dependence upon psychological theory, and becomes

exact in its methods and successful in its operations. It is quite possible that psychology will exert an influence upon the civilization of the future comparable to the influence of physical science in the past.

The Scope of Applied Psychology.—In speaking of the distinction between pure and applied science we left the point somewhat vaguely stated as involving differences of abstractness or concreteness of content, motives of truth seeking or money getting, practical usefulness or theoretical superiority to use. Let us now look a little more in detail at the domain of applied psychology and the kinds of task in which it engages.

In a general way, of course, psychology is applied wherever one uses his knowledge of the nature of the mind to understand and control the affairs of life. In the home, in relation to friends and acquaintances, in the casual associations of business, a thousand opportunities constantly present themselves. We find, however, that many of these lie in special fields. The first to be surveyed systematically was that of education, since the processes of teaching and learning are essentially mental, and psychologists were from the outset in especially close relation to educational work. The known laws of the mind's action lent themselves readily to the improvement of pedagogy; in fact the term "applied psychology" originally signified nothing more or less than a psychological method of instruction. "Educational psychology" began as a general description and explanation of the teaching and learning func-

tions in psychological terms, with rules of practice deduced from abstract principles. Gradually it took upon itself the further business of special investigation—the inductive solution of particular problems such as the possibility of transfer of training, i.e., of applying skill gained in one kind of work to tasks of another sort, the classification of mental types and the exact determination of subnormal and supernormal characteristics, the most effective methods of learning to read, write, spell, and study the various subjects of the school curriculum. The mind of the learner and the best way of habituating it to efficient action constitute the subject of applied psychology in the field of education.

More recently, running back in fact about twenty-five years, the methods and principles of psychology have been applied systematically to the work of the physician. Of course doctors have always been practical psychologists, often very skilful in spite of their lack of technical training. To suggest recovery to the patient, to eliminate fear and inspire confidence, to accompany drugs and bandages with words which produce a cheerful state of mind, has been recognized as naturally belonging to the medical profession. The special class of nervous diseases, however, called for something more than this casual and unsystematic practice. Medical science developed a refined analysis of these disorders, a reduction of them to mental terms, and a corresponding method of treatment. No one who is aware of the prevalence of "psychoneuroses" can doubt that applied psychology has here an unlimited field for

operation. It is a field in which there is much superstition, quackery, and pretense of learning, but happily a growing sum of scientific knowledge and an accompanying relief of human suffering.

Still more recently there has come a remarkable development of psychology in the field of industry. Beginning with the business of advertising,—that omnipresent appeal to attention and desire,—it passed to problems of preventing fatigue, mechanizing efficiently the processes of the office, factory and store, determining vocational aptitudes, and facilitating training. As yet this province is hardly more than a promised land through which explorers are cutting pathways, but the extent to which the work has already gone shows that the promise is genuine.

In addition to these main fields of education, medicine, and industry we may note the successful application of psychology in certain others more or less closely connected with the foregoing. Especially noteworthy because of their social importance are those of criminology and law. Crime is occasionally related to deficient mentality, hence the psychological examination of mental defectives and the elimination of criminal suggestion may be regarded as definite tasks of social reform. In the procedure of the court room the memory of the witness and the suggestibility of the juryman are perhaps susceptible of scientific test. Some enthusiasts have hoped for great improvement in legal practice and in the prevention of crime by making use of psychological methods.

Turning to another group of human interests, let

us observe that art, play, and religion are works of the mind which are not only better understood but also more effectively pursued with the aid of a knowledge of mental facts and laws. Beauty, whether of architecture or painting or dress, depends upon capacities of feeling. The drama appeals to instincts and emotions. Religious ceremony, both the solemn ritual of the church and the excitement of popular evangelism, show the use of suggestion in song, sermon, and prayer. A wide range of popular superstitions invites psychological attention, such as spiritualistic mediumship, clairvoyance, astrology, palmistry, mind reading, and the like. This business is for the most part sheer fraud and nonsense, nevertheless its effectiveness and the susceptibility of the public to such imposture rest upon characteristic habits of the mind. There is no better prophylactic against this insidious occultism than a dissemination of the psychology of deception.

Lastly we see that war makes room for psychology in a variety of ways. Soldiers are selected for different branches of the service by mental tests, and advancement in rank proceeds according to a psychologically devised scheme. The principles of optical illusion have helped to determine effective methods of "camouflage." The treatment of shell shock and the training of the injured for industrial activity constitute difficult but not insuperable problems. The maintenance of popular enthusiasm and the weakening of enemy morale by propaganda call for shrewd knowledge of mental traits and clever manipulation of stimuli.

Thus in innumerable ways the things with which we are surrounded and the events in which we take part reveal an actual or potential application of psychological principles. Both in its specialized departments and in its casual relationships life presents various opportunities for using our scientific knowledge of the mind. We may regulate conditions of sense perception, improve habits of memorization, control emotional reactions, cultivate volitional powers; and we may in this way become better learners, mechanics, doctors, lawyers, clergymen, teachers, parents, and leaders in all the walks of life.

The General Functions and Limitations of Applied Psychology.—In all fields, large and small, psychology is "applied" first in the way of understanding the facts in question, that is to say by describing and explaining them. Thus one obtains a better apprehension of the behavior of a child, the action of a political convention, the symptoms of a patient's mental disorder, the turbulence of an industrial strike, and the effect of religious ceremony. This is its *interpretative* function. Beyond it lie practical problems of control which it is the business of applied psychology to solve by technical methods, sometimes by inference from known psychological principles, sometimes by experimentation in the laboratory or elsewhere. Here we have the *constructive* function, deductive and inductive. The artful teacher occasionally increases zeal for learning among her charges by turning their tasks into the form of a game. A clever speaker ingratiates him-

self with his audience by a humorous story. Psychotherapeutic skill dispels chronic fear by appropriate suggestions of safety. Religious directors make services attractive by introducing social features or embellishing them with musical art. To improve habits of study by regulating conditions, to remove torturing obsessions or evil impulses from the mind by adroit "side-tracking," to lessen industrial accidents by preventing fatigue,—these are typical constructive problems for psychology to solve.

Neither in its interpretative nor in its constructive functions does applied psychology accomplish anything essentially different from the everyday operation of intelligence in human affairs. Like science in general it is only the further application of the methods of common sense. Sometimes, indeed, in dealing with refractory and belligerent human nature, it may fail where common sense succeeds. But on the whole its work is more effective because it is more cautious, more methodical, and more intelligent than the unsystematic perceptions and efforts of the casual observer.

Its limitations must not be ignored, however. The history of science shows that a new development has often been obliged to combat not only an unreasoning suspicion and antagonism, but an equally unreasoning overconfidence and "splurge." The unfolding of physics and chemistry and biology exhibits numerous instances in which the iridescent bubble of preposterous claims collapsed at the prick of hard facts. Similarly it must be acknowledged

that the applied psychologist, though he need not be a charlatan, sometimes closely approximates that status. The student of the subject must exercise caution in several directions. First he should bear in mind that the facts of human nature are exceedingly complex, the problems intricate, and that scientific psychological investigation has as yet made only a beginning. In some fields it is hardly more than a hope and a promise. In the meantime the prospectus must not be mistaken for the actual accomplishment. Second, there is too much hasty, superficial psychology,—unclear ideas based on inaccurate observation, inept methods leading to results which are incomplete or negligible. The practitioner who has dealt honestly with a problem of vocational direction or of psychasthenic obsession knows that its depths are dark, and that it is the part of wisdom to avoid the pretense of knowledge. Third, in attempting to regulate the mental life of an individual there is a peculiar danger of clumsy interference with nature's own procedure. The psychological ordering of play may be carried so far as to frustrate and devitalize the healthy play instincts. The method of imposing mental tests may frighten the subject into helplessness, or the inexpert effort to remove a persistent delusion may result in the substitution of a worse one. The accidents of a chemical laboratory are not more disastrous than the unwitting disturbance of the delicate mechanism of the mind.

Finally we should note that applied psychology does not of itself tell us what purposes are really

good, whether in education, medicine, industry, or any other field. It tells us only how best to attain those ends which we presuppose to be good. We can learn how the mind works to advantage in studying this or that subject, but not whether the subject is really worth studying. So too we can discover how to advertise successfully a harmful article as well as a desirable one, or apply hypnotism to fill the mind with distress as well as to eliminate an evil propensity. Where psychology seems to reveal the worth of something,—for example, the superiority of the method of learning material in large units rather than in small ones, and distributing the process over a period of time instead of trying to accomplish it at one sitting,—it will be found that there is always a presupposed value in the background, in this case the obvious importance of saving time and energy. Sometimes, however, the presupposed value is not so certain as it appears. Generally speaking, the student desires to use psychological methods only for good purposes, but it is worth noting that they can be used equally well for bad purposes, and that their practical effectiveness does not imply ethical value.

In passing from this introductory statement to a further exposition of the applications of psychology two possible lines of procedure suggest themselves. One is to plunge immediately into the jungle of problems which constitutes some part of the subject, getting one's scientific bearings and gathering fundamental principles and concepts of method as one goes along. The other is to study these principles

and concepts in advance, considering them first in abstract form with typical illustrations before observing their systematic application. The latter way, though somewhat slower, is probably the more fruitful for most students in the long run, hence we shall follow it in this book. Our next task, therefore, is to examine certain concepts which have proved especially important in the development of applied psychology, and which now pervade all its various fields. These are the concepts of *mechanical control* in the life of the mind, *subconsciousness, suggestion,* and *mental measurement.*

QUESTIONS AND EXERCISES

1. State as precisely as you can what you understand to be the difference between "pure" and "applied" science. Give several illustrations of each of these forms of science.

2. Show how pure and applied science are related to each other. Give illustrations from two or three different sciences.

3. What is the order of development of these aspects of science? What were some of the earliest kinds of scientific activity?

4. What kinds of experience first turned attention to the nature of the mind? Indicate two or three primitive psychological ideas.

5. Why was religion especially important in the development of psychology? What other interests had special importance in this development?

6. State several illustrations of practical psychology which you met in your elementary study of the subject.

7. Why was the systematic development of applied psychology so long delayed?

8. What are the principal fields of applied psychology? Mention some typical problems in each field.

9. In what other fields has psychology occasionally been applied? Indicate a typical problem in each case.

10. What are the "interpretative" and "constructive" functions of applied psychology? State an illustration of each.

11. Why is there so much popular interest in applied psychology at the present time? In what respects is much of this popular applied psychology open to criticism?

12. Formulate a general statement of the aims of applied psychology.

CHAPTER II

INVESTIGATION AND CONTROL

Analytic Observation.—As pointed out in the preceding chapter, the current wave of applied psychology is largely superficial and sometimes even superstitious in character. At its worst it is a hodge-podge of vague ideas about subconsciousness and suggestion, hypnotism, psychoanalysis, "thought-transference" and communication with departed spirits—sheer pseudo-science, not genuinely scientific at all. At best, while it makes use of more or less sound psychology and often helps serious students in their daily life, it leaves much to be desired in point of clearness and practical reliability. Like other forms of applied science it must attain certainty by perfection of method. What, then, are the characteristics of a truly scientific applied psychology?

They are, of course, the characteristics of science in general,—first and foremost the careful, comprehensive *observation of facts,* employing methods of accurate measurement as far as possible, and resulting in *exact description* and *systematic classification.* Secondly, science is the *explanation of facts* as the effects of definite causes, to which they are related *according to laws of nature.* Explanation

occasionally takes the preliminary form of *hypothesis,* which is a construction of the scientific imagination, to be verified or disproved through comparison with the facts. Third, in so far as the laws of cause and effect are known it is possible to *predict occurrences,* and in a practical way to *arrange conditions so as to produce calculated results.* In all these processes *experiment* often helps to determine with precision both the character of the facts and their relationships of cause and effect.

These are the essential characteristics of science in general, and consequently of the science of psychology, in both its pure and its applied aspects. However complex they may be in actual study or expert in practice, they are essentially only methodical refinements of the natural tendencies of the mind to understand the facts of experience and to produce such changes as seem desirable. As characteristics of applied psychology they are evidently included in what we have termed its "interpretative" and "constructive" functions. Let us look at them a little more in detail.

Whether the ultimate aim of the psychologist in any particular case is merely to understand, or is rather to effect some improvement, the primary question is of course, Just what are the facts? Accordingly the first point of method for us to note is the need of ascertaining exactly the details of the matter under investigation. Casual, unmethodical observation may be sufficient for ordinary purposes in our everyday life, or the quick intuitions of a gifted mind may go instantly and effectively to the

heart of a difficulty, but in general it is only by patient, painstaking examination of the facts of the case that practical psychology can accomplish its ends. The sad truth that much applied psychology, both popular and professional, is woefully hasty and consequently unreliable, makes this preliminary caution especially important. On the other hand there are plenty of illustrations of scientific advancement along a pathway of analytic observation.

Let us observe a few of these illustrations, beginning with the somewhat extreme one of Ebbinghaus' classical studies of associative memory. Nearly forty years ago he worked extensively with "nonsense syllables,"—for certain reasons the most appropriate material for use in experimental investigation. These he learned and relearned, in strings of different length, and under various conditions of order, internal grouping, interval between periods of learning, and so on. A more tedious task can hardly be imagined, yet it resulted in the discovery of important laws of memory which have had extensive effect upon methods of teaching. Similarly, the experimental studies of transfer of training, i.e., the extent to which the content and skill acquired in any field of learning are carried over to use in a different one, require patient, protracted work, sometimes with very uninteresting material, yet with the most painstaking attention to actual accomplishment. Those who deal scientifically with cases of mental disorder observe the symptoms with persistent care, in some instances over a long period of time, until the precise nature of the trouble becomes clear. In

ascertaining the effect of advertisements large numbers of data must be collected and analyzed methodically. Likewise the studies of fatigue involve the skilful use of instruments, and the accurate tabulation of results. In general, mental measurements must be made in such a way as to determine with precision the operation of those mental functions which we ordinarily estimate only with vagueness or rough approximation. The student who is beginning his acquaintance with this subject, especially if he is not familiar with the technique of science, should note the character of the investigations reported in current psychological journals.

Statistical data, though not usually of first rate psychological importance, are an occasional feature of investigation. Certain kinds of fact can be ascertained only by consulting many individuals and summing up their replies to questions, or averaging their performance of tasks. Much moral and religious information useful to clergymen and others has been gathered by questionnaires, and the extraction of psychological implications from educational statistics is endless. An especially interesting illustration is that of the tabulated results of the mental tests given to drafted soldiers during the war. These have important practical bearings on contemporary problems of education and political life.

Much of this analytic observation is wearisome business, and we do not wonder that many a practical psychologist is too impatient to bother with it. Human problems such as we have indicated as constituting the various departments of applied psy-

chology press insistently for solution. Eagerness to attain the ends sought in education, in psychotherapy, in commerce and industry produces hasty, inaccurate observation of fact, and consequent uncertainty of results. How easy it is to pass an impressionistic judgment on a child's intelligence, or to guess with ignorant assurance at the cause of a mental disturbance, or to dictate some new form of office procedure! The canon of scientific thoroughness is not established in applied psychology as it is in the applications of some of the natural sciences, and the temptation to formulate premature generalizations, dubious inductions, and superficial interpretations is especially great. There is no royal road to scientific achievement in this subject, however, and here as elsewhere the first steps in dealing with scientific problems are those of careful, analytic observation of the facts. The mental attitude and habit of patient, unhurried, thorough investigation are fundamental requisites for the advancement of applied psychology.

Scientific Explanation.—The second of these fundamental principles of science is *explanation.* This term has various meanings. In a general way we "explain" anything by relating it to something else which is known, or by including it in a class term. Thus we explain an unclear statement by showing what it really implies, or a case of illness by designating it as influenza, or a strike by referring to "contemporary social unrest." In psychology it was long the intellectual practice to explain facts of mind and behavior as manifestations of the soul, or

as the exercise of "faculties," such as perception, imagination, memory, reasoning, emotion, and will. This pre-scientific form of explanation is only a preliminary approach to the true kind; it is obviously not complete since it does not tell us precisely *why* the fact is what it is. The same faculty, or the soul as the possessor of these faculties, "explains" various phenomena indifferently. *Scientific explanation is the definite relating of a fact to its particular antecedent conditions or causes according to some natural law.* It shows the exact relation between cause and effect, condition and result, antecedent and consequent, and it shows this as a *universal* relation. Explicitly or implicitly it says: "*Whenever* such and such conditions are present, such and such consequences *always* follow."

In psychology these scientific relations of cause and effect are of several different types. Mental facts are explained as arising wholly or in part from objective experience, as when we consciously react to the sound of the dinner bell, or grasp the meaning of what we read. Less clearly we find the explanation of mental processes in preceding ones of a subjective character, as when one idea leads to another according to the principles of association, or strong emotion inhibits intellectual apprehension, or resolution produces confidence. Outward behavior is explained psychologically as the effect of mental causes,—for example, laughter at the ridiculous, replies to questions, execution of purposes, and so on. The fundamental explanations in any case are those afforded by the structure and function of the nervous

system, and the nature and previous experience of the individual. Our states of consciousness and our actions are explained by our physiological constitution and our past life.

For ordinary purposes the "law" in question is no more than the regularity of sequence between cause and effect,—these conditions always result in this way. Laws of wider scope comprehend phenomena of different kinds. Thus the law of association by similarity includes all sorts of similars, and the laws of inhibition involve various inhibitory factors. The discovery that sequences of phenomena may be generalized and formulated, or that a particular sequence falls under a known law, is an important explanatory achievement in psychology as in any other science. Practical psychology is forever trying to find out what relations exist between school conditions and school accomplishment, why a child seems mentally dull, what are the subtle causes of a case of neurasthenia, how religion helps to combat disease, why the labor turnover in certain industries is so large, whether certain races are better adapted than others to particular kinds of work, to what extent moving pictures tend to produce juvenile crime, why witnesses give such varying testimony, how the public is affected by newspaper reading, and so on.

Explanation, as we have seen, is a matter of different degrees. Sometimes we know the causes of a fact but not the exact nature of the law of its occurrence, as when a case of insanity is clearly traced to a severe mental shock, though the precise

internal details of the tragic development remain unknown. Sometimes, on the contrary, we know the general law which applies to an occurrence, but not the particular conditions of its operation. For example we may know in a general way that failure in school is due to deficient intelligence or bad habits of study, or poor methods of teaching, or a lack of interest in the subject, without knowing more exactly the nature of the defect in question. In such instances we use abstract terms to explain the facts. The explanation is good as far as it goes, though it is not complete.

The terms "subconsciousness" and "suggestion" are excellent illustrations of principles which possess explanatory value in psychology, but are ordinarily used in a very vague way. Many facts of interest to the student of applied psychology, such as mental disorders, the peculiar religious experience called "conversion," and the military state of mind termed "morale," may be interpreted as the result of subconscious conditions. Just what the subconscious function is, however, and how it works to produce these results are rather dark problems. More is known about the processes of suggestion, especially as they appear in the familiar arts of the doctor, the teacher, the orator, and the clergyman, yet here, too, the essential nature of the processes is far from clear. Increasing knowledge of the laws of their operation is extending the range of the psychologist's power not only to understand phenomena but also to accomplish practical results by control of the mind. So important are these concepts that

they will receive explicit presentation in the following chapters.

The kind of explanation which we have been considering—that which refers a fact to its special conditions and a general law may be called "mechanical." Quite different is the "teleological" form of explanation, which states the purpose of the fact, the aim of the action, or the end toward which the process is moving. Teleology implies either *conscious purpose* on the part of the agent,—this is its theological usage with regard to the divine guidance of the world order, and also its common meaning with reference to human affairs,—or, biologically, the *usefulness* of some structure or function in the life of a creature, as for example the adaptation of the eye to seeing, the glandular secretions to the process of digestion, and the like. With the theological significance of the term we are of course not concerned, nor indeed with its biological application. We cannot ignore the fact, however, that human behavior is teleological in the sense of being consciously purposive, and consequently that we cannot fully understand it unless we understand its aims. Actions are explained teleologically by ascertaining what the agent desires to do;—so it is to a greater or less extent with the performances of everyday life, the actions of children, the reading of books and newspapers, the purchase of commodities, and even the symptoms of nervous diseases. In most human conduct this is the only kind of explanation we look for.

The distinction and the relation between the two

types of explanation should be grasped clearly. The mechanical form explains in terms of past conditions, leading up to the present fact; teleology explains in terms of the future end of action, as represented in the present consciousness of the individual. The former depicts the fact as pushed into existence from behind, so to speak; whereas the latter presents it as drawn along by what is ahead. Evidently the two are not absolutely distinct, however, since the purpose which gives rise to behavior appears as a present state of consciousness, preceding the action, and accordingly may be numbered among the mechanical causes. It also calls for its own explanation, which is found in the preceding experience of the individual and the processes in his nervous system. Sometimes, too, purposes are so dim that they seem hardly more than blind forces driving their possessor on to he knows not what. The important point to observe is that the teleological explanation in terms of purpose may be reduced to a mechanical, or at least to a quasi-mechanical form, in the interests of scientific procedure. Purposive relations are not thereby abolished, nor is their reality lessened, but they are translated, so to speak, into the language of scientific explanation.

Consider, for example, the action of dropping work at the sound of a noonday whistle and going to lunch. Obviously the performance can only be understood in terms of its purpose, yet it is equally true that the psychophysiological explanation of the movement is found in the auditory sensations, the feelings and ideas, the instincts and acquired

habits of the person, as these operate through the mechanism of his nerves and muscles. To this complex of mechanical factors we must add, of course, the idea of the lunch or its physiological correlate in the cortex of the brain, amplifying the sensations and setting the motor mechanism into action. Or, to take another illustration, an industrial "strike" cannot be understood except in relation to the goal at which it is aimed,—higher wages, shorter hours, or whatever the desired end may be,—but it is evident not only that the goal is represented by a state of consciousness which produces the activity of striking, but also that the desire in question arises from conditions which work mechanically to produce it, such as low wages, fatigue, belief that other workmen are better treated, the exhortation of a leader, and so on.

Applied psychology uses primarily the mechanical form of explanation. It seeks to explain occurrences in terms of antecedent causes or conditions, including states of consciousness or their corresponding processes in the brain. It acknowledges the factor of purpose, but it treats this as a part of the mechanism of human nature and its environment with which it operates.

Mechanical Control.—The significance of the foregoing considerations appears clearly when we face the constructive problems of applied psychology. Broadly speaking, it is only by regulating conditions that desired results can be attained; if these conditions are appropriate the outcome follows with the certainty of natural law. The end is realized by

setting nature itself into mechanical operation. If, for example, the psychologist's task is that of securing better attention in school, he goes about it by modifying the environment of study so that the pupil's mind is less subject to distractions, removing irrelevant sights and sounds, using devices to make subjects interesting, providing frequent rest periods, and so on. If he also appeals to the will, urging, exhorting, persuading, or scolding, this treatment must be regarded from our present point of view simply as establishing certain mechanical conditions in the pupil's consciousness itself, i.e., bringing into natural operation certain motive forces in the mind. Similarly in dealing with juvenile delinquency the psychological method is that of removing particular temptations or removing the offender from them, providing substitutes for undesirable aims, showing the inevitable consequences of wrong doing, punishing misdemeanors with justice and rewarding moral effort with approval and encouragement. Here again the appeal to the will, which may be appropriate as a part of the method, should be considered as a means of arousing particular states of consciousness which work together with other conditions to produce the desired result. Likewise the science and art of psychotherapy, quite as in ordinary medical practice, seek to create conditions such that the mechanism of nature restores the sufferer to health. In the field of commerce the effort of the salesman is to suggest purchase in such ways that the customer responds more or less automatically.

In all these problems and others of similar character the emphasis of applied psychology is upon the mechanical processes which facilitate control. This point of view is probably for most persons a somewhat unnatural one; in fact it is so natural and easy for us to appeal to the will in situations involving volition, and often so difficult to discover or to produce appropriate mechanical conditions, that we accomplish but little of what is really possible. We need as practical psychologists to cultivate the "mechanistic attitude" toward problems, that is to say the mental habit of regarding troubles as the mechanical effects of certain causes, effects which can be prevented by modifying the mechanism in question. Such a dispassionate view, analytic and explanatory, gives distinctly the best command of a situation. In any field of human performance the most successful worker is the one who best understands the laws of cause and effect. This does not imply a lack of emotion or of appreciation of the will. Rather does it enable the manipulator of human affairs to use more intelligently and effectively the teleological forms of appeal. These become special tools, used with skill in shaping effort or guiding tendencies in the right direction. For example, a Scotch clergyman of the writer's acquaintance had occasion to try to reform a fellow countryman who was addicted to drink. He discovered that the most powerful factor which he could bring to bear on the weak will was the contemptuous assertion that the drunkard was "no a true Scotsman." This intolerable slur called into play deep motive forces of

character which served effectively to overcome temptation.

Let us observe once more that skilful control of the means to an end does not imply the ethical desirability of the end itself. In applied psychology as in mechanical industry it is possible to have unworthy aims, and to use the best machinery cleverly in turning out a worthless or harmful product. Thus one may subserve a wrong disciplinary aim by creating a psychasthenic fear in the mind of a child, or force an injurious food on the public by skilful advertising, or intensify an unhealthy theatrical taste by diffusing salacious suggestion in poster form. There may seem to be special danger, indeed, in the scientific teaching of methods of "putting things over" without regard to their merits. On the other hand we must acknowledge that the aims of applied science are generally good, and that advances in technical skill naturally draw keener attention to the value of the ends which are sought. The adroit use of mental mechanism for bad purposes ultimately defeats itself; the trickster's cleverness does not save him from his inevitable fate of distrust.

Experiment.—All science attains a measure of perfection through *experiment*. The artificial arrangement of conditions, especially in the laboratory and with the aid of apparatus, helps to determine the precise character of facts, to suggest explanations, to test hypotheses, and to reveal possibilities of control. By construction on a limited scale the investigator obtains preliminary guidance toward larger operations; success in experiment presages

success in dealing with important problems of real life. In this respect applied psychology offers no exception to the general practice of science. By means of its methodical manipulation of causes and observation of effects it discovers the mechanism of the matter under consideration, and brings this mechanism under control. Let us note a few illustrations.

Several psychologists have investigated the effects of drugs and stimulants, particularly tea, coffee, tobacco, and alcohol, upon the motor and mental processes. They have done this by giving appropriate laboratory tests after the subjects had taken doses of various sizes and at various intervals. The results are too complicated to be stated in detail here, but it may be said that in a general way they confirm prevalent ideas about indulgence in narcotics, though with some interesting and important qualifications. For example, the experiments reveal clearly the magnitude of individual differences in response to narcotic stimulation, the partial efficacy of expectancy and "suggestion" in producing characteristic symptoms, and the different, sometimes diametrically opposite effects of large and small doses. They also show unmistakably that "stimulants" eventually become "depressants." Hollingworth's conclusion is that "in every case except beverages containing caffeine, efficiency forbids their use. And even here, large doses taken for relatively short periods show disturbances in the general bodily economy of some individuals." [1]

[1] Hollingworth and Poffenberger, *Applied Psychology*, p. 184.

Another problem much investigated by experimental methods is that of the proper length and distribution of periods of learning. For example, Starch had four groups of subjects perform the same task, a "substitution test," under different conditions. "The first group worked ten minutes at a time twice a day for six days; the second group worked twenty minutes at a time once a day for six days; the third group worked forty minutes at a time every other day for six days; and the fourth group worked right on for 120 minutes at a single sitting." [1] The results showed that the first group made the most rapid improvement; its efficiency after two hours' practice was more than double that of the fourth group. They also indicated that the economical limit of brevity and frequency had been reached; further subdivision of the working periods would have resulted in a loss of efficiency. The important principle revealed by such experiments is that short periods with frequent intermissions are better than long ones. The most economical length and distribution depends both on the age and mental powers of the individual learner and on the nature of the work. Subjects of mature reflection call for protracted study, during which all the mental forces are gradually brought into play, followed by an appropriately long interval of rest and the subconscious "setting" of what has been learned.

Interesting experiments were conducted by Anderson to ascertain the cause of stuttering.[2] This

[1] Drever, *The Psychology of Industry*, p. 89.
[2] *Journal of Applied Psychology*, Vol. V, No. 4, December, 1921.

difficulty has been attributed to a wide variety of causes, such as a general lack of motor coördination, special peculiarities of inhibition, defective visual imagery, suppressed "complexes," and so on. The experiments were devised to test the various hypotheses, and were applied to stutterers, ex-stutterers, and non-stutterers or normals in order to ascertain precisely the differences between the different types. They consisted of foot-tapping, hand-coördination, several tests for visual imagery, stability of complex reaction-time, and the amount of inhibition in a complex reaction. The results served to discredit some theories, and indicated that stuttering is a manifestation of general psychomotor traits including "difficulty of coördination of the kinesthetic and other imaginal elements when they appear in large numbers simultaneously," and "lack of ability to inhibit an impulse after it has found partial expression."

A remarkably interesting performance was that of Baird, who dealt with the difficulty presented by the increasing size of the New York City telephone directory.[1] The problem was that of avoiding the confusion and mistakes which followed upon the use of the smaller type made necessary by the increasing number of names. He proceeded from the fact that the ordinary mistake is that of coupling a particular name with the number on the next line above or below. To lessen this tendency he widened very slightly the space between the lines, and also indented alternate names and their correspond-

[1] *Journal of Applied Psychology*, Vol. I, No. 1.

ing numbers so that the indentation served to carry the eye along the proper line. The effectiveness of these devices was demonstrated by experimenting on persons who were more or less accustomed to the use of a telephone directory. The outcome was a typographical arrangement which economized space and at the same time reduced the number of mistakes in calling numbers.

These illustrations, taken almost at random from recent psychological literature, show points of experimental application of psychology to matters of daily life. Others will be noted in the following chapters. It must be acknowledged that the complexity of human behavior and the fact that the experimentalist is always dealing with a human will, with its profound subtlety of operation, create difficulties of investigation which are sometimes insuperable. Pretentious experiment, too, may merely confirm in slight measure the unprofessional observation and common sense of intelligent persons. Here and there, however, we find investigators measuring mental processes in significant ways and making promising explorations of the unknown. Altogether, psychology may be regarded as having taken its place among the experimental sciences.

QUESTIONS AND EXERCISES

1. What are the general characteristics of science? Give an illustration from some science with which you are familiar.

2. Show how psychological analysis differs from ordinary observation of mental traits, e.g., in investigating juvenile delinquency.

3. What is the general character of scientific explanation? State several laws of nature which explain occurrences. What is "hypothesis"?

4. In what terms are mental facts explained? E.g., a headache, a "bright idea," the action of a mob.

5. What is the difference between the mechanical and the teleological forms of explanation? Why is the former especially important for applied psychology?

6. What is "mechanical control" of behavior. How would you apply this principle in the case of a frightened child?

7. Contrast the mechanical and the teleological forms of control in dealing with the tendency to dishonesty in examinations.

8. Show how a mechanical interpretation may be given to an appeal to the will, e.g., such exhortations as "Brace up," "Don't show a yellow streak," "Play the game," and the like.

9. Why is the problem of mechanical control more difficult for psychology than for some other sciences?

10. What, in general, are the characteristic features of an experiment? Show how experimentation helps in the observation and explanation of psychological facts.

CHAPTER III

SUBCONSCIOUSNESS

Sources of the Idea of Subconsciousness; Its Scientific Status.—The concept of subconsciousness has played a peculiarly important part in the development of applied psychology. In the popular view, indeed, it is the dominating principle of the subject. Mental and physical marvels as well as less striking phenomena of everyday life are attributed to the activity of the "unconscious mind." It serves to explain strange occurrences in hypnosis and trance; it is commonly regarded as the agency of "clairvoyance" and "thought-transference." Facts and fancies without number find a home in this mysterious but capacious concept. In a more chary fashion it is accorded recognition by the psychological profession; it appears sparsely in the pages of standard textbooks, and conspicuously in works on abnormal psychology. Though its rôle has too often been that of a superficial pretense of knowledge, and even of harmful superstition, it nevertheless possesses scientific value, and accordingly our next task must be to examine it.

Its roots are found in a prescientific era of mental culture. In the primitive experience of mankind certain phenomena of human life gave rise to the

vague hypothesis of a soul somewhat distinct from the self of ordinary observation. Mysterious powers of intelligence and strange forms of behavior, dreams, visions and trances, what we now term "hyperesthetic perception" and apparently "telepathic" communication, automatic action of various kinds such as paroxysms of singing and dancing, insane deeds and the like, all called for interpretation and led to the supposition that the normal, waking mind is only a part, and comparatively an unimportant part of human nature. Beyond it seemed to stretch a realm of intelligence and will which worked wonders. To understand and use these mysterious powers was the art of the magician, the soothsayer, and the priest.

Religion and philosophy developed in much detail the concept of a soul underlying and transcending the limits of ordinary experience. This invisible entity was regarded as the bearer of one's essential character, the source of conscious powers, of moral judgments and religious faith. Psychology, the roots of which are found in part in religious thought, naturally took over this hypothesis, and though it was ultimately discarded as irrelevant to the purposes of the science its influence continued in the psychological acknowledgment of a "subliminal" realm of the mind. In addition, certain lines of theoretical speculation about the relation between the mind and the body, and still more widely between mind and matter in the universe at large, tended to enlarge the concept of mental life beyond the limits of actual consciousness. The latter, it

seemed, must find its explanation in some non-material reality—an unconscious or subconscious mind.

Most effective in establishing the concept were the abnormal phenomena connected with the practice of hypnotism, especially trance visions and automatic performances. The peculiarity of these manifestations appeared to place them beyond the range of explanation in terms of the known laws of mental action, and to suggest the operation of the mind on another level and with extraordinary faculties. In popular psychology the term "subconscious" retains this vaguely metaphysical character, i.e., it stands for a mysterious entity or power which causes strange occurrences in human life. Though the laws of its action are unknown the word affords a verbal explanation of any otherwise unexplained mental fact. To the subconscious are attributed marvels of perception and information, hypnotic trance and multiple personality, the cure of disease, and the reformation of character,—all this without a clear understanding of the processes involved. In this half light of knowledge superstition and fraud have had an inviting field, of which they have taken advantage to such an extent that some psychologists are inclined to repudiate the term altogether.

As in other departments of science, however, crude and superstitious ideas led eventually to more precise and workable ones. The subconscious, carefully defined, became a respectable psychological concept. Subconscious functions were definitely related to those of normal consciousness, and their shadowy, fearful character was dispelled by the light

of investigation. Those who now use the term in the field of scientific psychology do so with clarity. Yet much misunderstanding and nonsense remain attached to the term, and accordingly it is the student's first duty to avoid the popular, superstitious usage of it, and to comprehend its meaning in a definite, psychological way. In order to do this let us note some of the varied phenomena which are included by the term. Properly conceived, as we shall see, it is a valuable interpretative and constructive idea.

Varieties of Subconscious Fact.—There are in normal, everyday mental life many facts of sensation and perception which may properly be called subconscious. Thus we are vaguely aware of sights, sounds, pressures, and the like which are not in the focus of consciousness, but which are more or less discernibly in the conscious field. Objects seen with "the tail of the eye," the faint murmur of distant voices or the ticking of a clock, the pressure of clothing, the temperature of the atmosphere, the slight muscular strain and relaxation of breathing, the total bodily "feel" termed coenesthesia—these and other items of mental content must be distinguished from the clear center of conscious process. They may be brought into focus instantly by increasing the intensity of the stimulus, pressure for example, or by merely calling attention to them, but ordinarily they fade into the marginal blur of the mind's awareness, and remain there unnoticed. But though they are not explicitly recognized in this penumbral state they may nevertheless affect our general men-

tal condition. Subconscious pains of indigestion may discolor one's outlook upon life.

Secondly, the complex processes which involve association, especially memory, imagination, and reasoning, point to a subconscious realm of the mind. Where and how does past experience remain, so that we can recall it in the form of conscious memory? Where do the multifarious items of our knowledge reside when we are not using them? What is the mental status of the name which we almost but not quite remember? It would seem, indeed, that the whole business of remembering implies the existence of a huge reservoir of subconsciousness. Likewise imagination both in its ordinary and in its artistic forms appears to well up from some obscure depth of the mind. Dream and fancy seem often to reveal a deeper stratum of our mental being than the surface along which they pass. And just what, psychologically speaking, is "poetic inspiration"? What are the resources of the musical composer, so much greater than he himself is clearly aware of possessing? Many an artist has borne testimony of the strange way in which the works of his genius flash into his mind with a compelling force of their own. Whence do they come? The easy answer is "the subconscious," the working and tendency of which may even be felt before the conscious illumination arrives. Further, there are the cases in which a process of rational thought is worked out subconsciously, perhaps during sleep, so that the solution of the problem toward which the thinker had struggled in vain flashes suddenly before him. It is a common

experience to "sleep on" a difficulty, and waken with a clearer view of the matter. There are also well authenticated instances of the solution of problems involving a high degree of mathematical or other technique in the subconscious condition of sleep, so that in the morning the fortunate worker found himself in conscious possession of the answer or method of operation.

In the third place, feelings and emotions are characteristically sub- rather than clearly conscious. The object which excites them is in the focus; the affective tone and attitude are marginal. Liking and disliking, sympathy and repugnance, anger, fear, pride, embarrassment, and a host of other emotional impulsions owe their peculiar force to processes which take place below as well as above the threshold of awareness. In fact we sometimes find ourselves tender with sympathy or blazing with wrath before we become explicitly conscious of the precise nature of the distress or the insult which thus mechanically produces the emotion. Furthermore, those vague, more or less pervasive and permanent mental traits which we call "mood," "sentiment," and "temperament" are likewise composed in large part of subconscious elements. The enduring background of the mind is serious or cheerful, calmly rational or nervously "flighty."

Finally, the phenomena of will show innumerable instances of what Jastrow terms "subvoluntary" action, in which impulse and inhibition play their parts below the threshold of cognition. Reflexes, habits, the absurd performances of the absent-

minded man, the choices and decisions which we find somehow made within us rather than consciously by us,—all these, whether regarded as physiological mechanism or mental process, are in some sense subconscious. Reaction as well as apprehension and appreciation often takes place in the shadowy outlying regions of our mental domain.

Turning to the field of distinctly abnormal psychology, we observe everywhere signs of mental functioning which must be differentiated from that of ordinary consciousness. Hyperesthesia, anesthesia, amnesia, trance vision and audition, automatic speech and writing, hypnotic performance, and the strange phenomena of multiple personality, all bespeak a secondary form of mentality, more or less systematic and comprehensive in structure and function. The "subliminal self" in its fuller development appears to have its own focus and margin of awareness, its own impulses and emotions, so separate from those of normal life as to deserve another designation. Since, however, these abnormal facts when studied in detail show distinct resemblance to those of normal experience to which we have applied the term subconscious, we may properly extend the latter to cover them.

General Concepts of Subconsciousness.—How shall these various phenomena be conceived? What general types of conceptual explanation may we apply to them? The answer to this question is threefold, that is to say the facts range themselves in three groups, closely related but of somewhat different character. In addition there is a fourth con-

cept of the subconscious which is very commonly held, but which is of dubious scientific acceptability.

(a) *The physiological subconscious.* Some of the phenomena under consideration appear to be essentially the automatic working of the nervous system, with or without a vague awareness of what is being done. Mechanical movements such as winding a watch, whistling a familiar tune, movements of dressing and eating, absent-minded performances, the scrawls of "automatic writing," and even some more complicated actions of speech and behavior appear to be of this type. They are not consciously directed, and in certain cases they do not seem to be conscious at all. To a great extent they are adequately explained by the concept of nervous and muscular mechanism, which under given physical stimulation produces such reactions. They are for the most part of an habitual sort, and since the general law of habit is to dispense in some measure with conscious direction, they are accompanied by no more consciousness than is inevitably produced by the stimulus, or is requisite as a general guard against interference with the movement. In many instances action appears to be quite unconscious. To what an extent our daily life is mechanized in this fashion few persons appreciate except those who have studied the matter.

The same concept is commonly held in psychology to cover the facts of retention, i.e., the more or less permanent possession of past experience. The "subconscious reservoir," as it was called above, in which are stored our unused memories, possible ideas, ma-

terials of imagination, in short the sources of our various associational processes, may be nothing more than the delicately plastic and minutely complicated system of nerve fibres in the brain, which somehow retains the past and supplies the mind with its resources. Subconsciousness in this sense of the term, however little we yet know in detail about the physical functions of the brain, is nevertheless a scientific concept, theoretically susceptible of more precise delineation.

On the other hand it must be borne in mind that there are limits to the extension of this concept. Many of the facts called subconscious are so unlike nervous reflex and habit that we must find another explanation. Complicated performances of reasoning and self-directive activity are frequent among the facts to be explained, performances which under ordinary conditions we should understand to be the work of consciousness, but which as occurring do not seem to be conscious in the usual meaning of the term. Sleep walking and hypnotic behavior may serve as illustrations. Since these acts are in some degree intelligent, and since at the same time the subject is not normally conscious, we must find another meaning for "subconscious" than mere cerebral mechanism. It is significant, too, that reflex and automatic actions usually have an accompanying consciousness more or less vague in character. Here again we must observe that subconscious facts are not purely physiological.

(b) *The marginal subconscious.* Many of the facts in question are understood as belonging to the

margin or fringe of the field of consciousness. We are at all times faintly aware of much beside the object which occupies the focus of our attention. Sensory stimuli of various kinds, external and internal, are perceived in this way, sometimes with the effect of turning attention to them, sometimes without any noticeable diversion of the focal process. Passing shadows, sound of distant voices, the flavor of food, the slight pain of a strained muscle, are illustrative cases. Our constant feeling of bodily selfhood is apparently of this sort, a vague sensory content produced by the concurrence of innumerable physiological processes. If the object of marginal awareness is unimportant it remains untouched by the spotlight of attention, and in general is not remembered as a part of the total experience. Yet its marginal presence in the conscious field may be directly observed or otherwise demonstrated. It has been found that hypnotized subjects can recall minor details of a scene or event, details to which they had paid no attention and which they were unable to recall in their normal condition of mind.

Not only sensory content, but also processes distinctly ideational seem to have a place in the fringe of consciousness. Dim memories of incidents haunt us as we carry on our daily work. Anticipations of coming events, unsettled problems, troubles and worries likewise make themselves vaguely felt as we follow the main track of our business. Possibly rational processes take place in the same shadowy fashion. Certain it is that the feeling tone of our ideas is of this marginal character, and that impulses

may operate before their direction appears clearly in mind. We smile or strike or ejaculate before we know what we are doing, and yet not without a vague feeling of impulsion.

How extensive this subconscious fringe is we cannot say with assurance. It fades away from the focus so rapidly that we are unable to tell just what its outer region contains, or recall items which must have been included in it. Does it hold in dim consciousness all our past experience, our unused information, all those factors which at one time or another helped to make up the conscious self? This seems a large assumption, and as was pointed out above the current psychological view is that retention is a physiological process, probably limited in extent. Yet the impossibility of drawing any line which distinctly bounds the conscious field leaves the matter problematic. In any case "subconscious" means less conscious, or marginally conscious, and the margin is broader than at first appears.

(c) *The dissociated subconscious.* Thus far, then, subconscious means *not-conscious* (physiological), or *less conscious* (marginal). A further meaning is found in the facts of mental dissociation. The mind is systematic in structure and function; i.e., part is related to part by links of memory, habitual associations, general tendencies of thinking, characteristic inhibitions, and the like. This systematic nature may be conceived as analogous to that of the brain, with its marvelous intricacy of interwoven neurones, major and minor cortical areas, and interrelated activities. Under certain conditions the whole system

splits into separate parts, so to speak, which function more or less independently. In such cases the victim cannot recall past experiences or act in his usual way. He may fail to recognize his family and friends, lose lifelong habits, and display new emotional and active traits. Yet the loss is not absolute or indeed real. The dissociated system of ideas, feelings and impulses continues to exist, perhaps dormant for weeks or months, perhaps occasionally returning in normal expression of the personality.

Dissociation shows various forms and degrees of thoroughness, ranging all the way from little slips of memory, inconsistent ideas, and absent-minded actions to the appearance of distinct personalities, each with its own name, habits and characteristics. The dissociated system may be more or less focalized. In some instances it is only an outlying part of the fringe of consciousness; in others it possesses its own center and margin, by which it perceives, thinks, feels, and acts as does the normal mind. It ordinarily appears as a temporary aberration or alternation from the main system, but it may work simultaneously, as in the absurd performances of an absent-minded person. Sometimes, indeed, it works in such a way as to indicate that two separate foci of consciousness exist at the same moment. Thus a trance subject will speak one discourse and write another, apparently "co-consciously," each discourse expressing purpose, ideas, and selection of material, but neither showing any rational relation to the other.

These strange phenomena of dissociation may be

regarded as either separately conscious, or marginally conscious, or merely physiological. They are "subconscious" in the sense of being distinct from the normal mental system from which they are split off. They do not reveal any essentially different kind of mentality from that of ordinary life.

(d) *The unconscious mind.* In addition to the foregoing meanings of the term there is another which is commonly designated as the "unconscious mind." According to this conception the mind is divided into two parts, the conscious and the unconscious. The latter lies below the threshold of awareness like a vast, dark, uncharted sea of powerful mentality, not identical with brain process, and perhaps independent of this. It is a great storage reservoir of mind, occasionally spouting some part of its contents up above the surface, but for the most part pursuing its ways in the dark. Its incalculable behavior constitutes the source of much of our everyday life, but more especially the phenomena of abnormal psychology, dreams, trances, and mental disorders of one sort and another. Its powers correspond in a general way to those of the conscious mind, but operate without consciousness, or with a form of consciousness which is peculiarly their own. These powers are usually, though not always, believed to transcend those of the normal mind, and to include ability to foresee the future, to send and receive telepathic messages, and to communicate with the dead.

This theory is widely held, not only in a popular religious form by spiritualists and others, but also

by some physical scientists. Minus its religious and occult features it is offered by psychopathologists, in conjunction with the concept of dissociation, as an explanation of certain forms of mental disease. Thus Coriat remarks that "Consciousness . . . is not the indispensable characteristic of mental life, for psychoanalysis has shown, particularly in the study of dreams and the study of hysterical patients, that subconscious mental processes, even of a most complex nature and of which the individual is not aware, may lead an active existence and so influence thought and behavior." The principle of the dual nature of mind, he affirms, is accepted by all psychopathologists, in spite of their differing conceptions of the relation of normal and abnormal phenomena to the subconscious. And he adds, "Of course it is in the realm of mental pathology that we find the best known examples of subconscious phenomena." [1]

The scientific eminence of certain specialists in nervous disorders and the popularization of Freudian theories have helped greatly to disseminate the view of the subconscious as "unconscious mind," and to make this, in fact, the most commonly accepted meaning of the term. It is not accepted, however, by distinguished professional teachers of psychology; indeed they uniformly regard it as essentially dubious. "Unconscious mind" seems to these psychologists a self-contradictory term. Its processes are not discovered by introspection, but only by their outward manifestations, and the latter, it is declared, are adequately explained in other ways. A

[1] Coriat, *Abnormal Psychology*, pp. 10, 11.

dissociated *consciousness,* with its marginal accompaniments and physiological substratum, fully accounts for the phenomena in question. As a matter of fact the common characterizations of the unconscious mind usually show that it is not regarded strictly as *un*conscious, but rather as dimly or separately conscious; in other words it really reduces to the "margin" and "dissociation" meanings. More superstitiously its awareness is supposed by uncritical persons to be of a uniquely peculiar sort, quite distinct from that which is revealed by introspection, and transcending normal limitations of time and space. This, of course, is unscientific. Not only is the evidence highly questionable, but the ascription of the phenomena to a power which, since it is neither physical nor conscious, cannot be directly verified empirically, and is not definable in the only terms we know, does not really *explain.* Altogether, the "unconscious mind" seems to trained psychologists to throw no real or helpful light on the facts. These must be understood in accordance with the three preceding concepts, i.e., the physiological processes of the nervous system, the marginal details of the conscious field, and the more or less completely dissociated systems of mental elements.

The Subconscious in Applied Psychology.—It was necessary for us to discuss the meaning of subconsciousness with the foregoing measure of detail partly because of the current misuse of the term, and partly in order to make clear its positive significance for applied psychology. Just what is the idea good for? What does our knowledge of these

physiological, marginal, and dissociated processes amount to in practical life?

In answering this question we should note first that in so far as applied psychology is interpretative we have here a concept of wide application. Much of our daily life takes place in a subconscious fashion and we understand it better if we possess an explicit and comprehensive concept of this part of our nature. Consider, for example, the apparently simple but really complicated performance of steering an automobile. Neuro-muscular mechanism, marginal awareness of significant and insignificant objects in the total field, underlying purpose and sense of direction, all play their subconscious parts in the process, while focally one may be fixating a point in the road, or a topic of conversation with one's companion, or a subject of solitary reflection. Again, the notoriously subconscious phenomena of dreams, with their casual stimuli and covert aims, lose their mystery if not their oddity when interpreted in the conceptual terms which we have formulated.

It is especially important to observe that "perceptions" of all sorts are largely subconscious. For perception, as the student of elementary psychology will remember, is a mental process in which a group of sensations is given "meaning" in accordance with past experience. Thus a jumble of light and color becomes for us a human face, and a succession of queer noises is understood as speech. This interpretative function works more or less subconsciously in the physiological and marginal senses of

the term; in other words we recognize persons and things without knowing just how we do so. In some individuals the process takes place with extraordinary subtlety and assurance. A mere inflection of voice or flicker of an eyelash, an inconspicuous relationship or bit of action suggest to them a depth of significance which lies quite beyond the usual ken. They *feel* with what is sometimes termed "intuition, but what we must regard as extremely facile perception, facts of past experience, premonitions of the future, and the contents of other persons' minds,—matters which may wholly escape the rest of us. Since perception commonly leads to action, such uncanny intuition may issue in utterance that is a revelation of truth or in performances like finding a missing article which seems to defy explanation. Complicated with deception as such performances frequently are in "psychics," they produce results which baffle even highly intelligent minds which do not happen to understand the psychology of the process. All this, however, when it is not as too commonly happens the sheer pretense and fraud of charlatans, may be understood from the psychological point of view as the operation of subconscious mental functions in experience, not generically different from ordinary perceptual phenomena which do not excite wonderment in the least.

Secondly and constructively, in so far as we grasp the conditions and laws of subconscious mental activity we can apply them to practical problems. For subconsciousness works *mechanically*. It acts with a regularity of cause and effect which is

distinct from rational self-direction and inhibition. If we learn the laws of its activity, therefore, we can here as elsewhere in nature manipulate causes so as to produce calculated effects. In education, in medicine, in business, in legal practice, in religion, and in many less systematized departments of our life we can acquire the art of stimulating the subconscious mechanism so that it responds as we desire. This is the process called "suggestion." It is what the tactful teacher does when she encourages the child with anticipations of success. It is what the doctor does in eliminating fear and producing expectancy of health in the mind of the patient. It is the business of the salesman to suggest, quite as much as to argue, the desirability of the goods; of the lawyer to imply as well as to prove the guilt or innocence of the accused, so that the jury is subconsciously swayed; of the clergyman to produce and to work with subconscious religious sentiment. In these and innumerable other cases the mental processes of the individual run more or less automatically along subconscious levels. Some persons have a natural gift of ability to appeal to this part of the mind and to secure a favorable reaction. Psychology may hope to learn how this is done, to formulate practical rules for doing it, at least in some measure, and also to guard against the abuse of the practice in irrational ways. The diffusion of scientific knowledge on the subject will help to protect society against numerous forms of fraud and superstition. As we have repeatedly intimated, psychology has no more important task than that

of freeing mankind from the evil power of those who prey on him.

It is also important to observe in this connection that what we call "attitudes" are largely subconscious. Our underlying dispositions of liking and disliking, of hope and discouragement, of familiarity and unfamiliarity, of curiosity and indifference, and numerous other transitory or permanent traits of mind are often the most effective factors in daily life. Thus the teacher's fundamental subconscious satisfaction in meeting classes, and the student's subconscious eagerness for information, are basic conditions of pedagogical or scholarly success. In industry an attitude of distrust or insubordination toward superiors may be a hopeless obstacle to social harmony and efficiency. Similarly the patient's confidence in his physician is generally requisite in order that treatment may be effective. Where the attitude is wrong, the trouble lies not in any one thing which is done, but rather in the mental atmosphere in which everything is done. In fact the successful conduct of human affairs depends everywhere upon the right attitude as well as upon the right technique of operation. Hence the production, maintenance and control of attitudes constitute by no means the smallest problems of applied psychology. In subsequent chapters we shall see again and again that specific rules depend upon this general truth.

"Freudian Psychology."—The psychological theory and practice associated with the name of Sigmund Freud offer notable illustrations of the

importance of the concept of subconsciousness in applied psychology. The theory in its most general form of statement is that human experience and behavior are determined fundamentally by subconscious, or as the Freudian terms them "unconscious," interests which express themselves directly and indirectly in characteristic ways. For Freud himself the most powerful and far reaching of such interests are those of sex instinct, though other strong emotions and impulses occasionally play the leading rôles. Since the sex impulses, and to a less extent the others also, are repressed by the customs and conventionalities of civilization, these unconscious forces find expression in subtle and symbolic ways. Freud was led to the formulation of the theory by discovering in his professional experience as a psychopathologist that the queer symptoms of nervous disorders were the effect of repressed tendencies which were thus trying to release their powerful energies. Oddities of behavior, automatisms of action, unexpected slips and turns of speech, hallucinations, and especially dreams, proved to have indubitable significance as evidence of underlying motives.

If we look a little more closely at the details of the theory we see that it has three principal features. In the first place it tells us that mental and physical activity is produced by certain forces which are the very vital essence or "libido" of the self. Most prominent among these is the instinct of sex with its derivative interests, but other inborn tendencies and deep desires such as fear, anger, and

self-assertion supply the energy and seek to dictate the form of human life. These "Freudian wishes" are *unconscious mental traits* which are constantly striving to thrust themselves up above the threshold into the realm of conscious action and thus to obtain their normal satisfaction. The effort often fails, however, because in their crude form they run counter to the institutions of social life and civilization. Hence, in the second place, they are *repressed* by social disapproval, moral teaching, and religion. These environmental forces produce in the individual's own mind a "censorship" which is ever alert to prevent the wish from manifesting itself openly. Standing guard at the gateway of consciousness, so to speak, the censor effectually shuts out disreputable psychical intruders. But the latter, though frustrated, do not perish. Desire remains alive and active in its own subconscious fashion, and since it is denied open indulgence it finds, in the third place, *symbolic expression* through some associated item of the mind's content. The latter may be any sort of mental image, idea, or tendency to action, and may be logically quite irrelevant to the unconscious desire with which it has become associated in a "complex." There are many common symbols such as rocks for difficulties, the cross for sacrifice, fire for passion, and the like, as well as a multitude of less intelligible ones. Sexual relations have their own astonishing variety. Language, art, and religion swarm with them. They are perfectly natural though often obscure expressions of ideas and purposes, conscious and unconscious; and a large part of Freudian

psychology consists in the discovery and interpretation of them.

The theory abounds in technicalities, such as the "foreconscious" or more accessible part of the subliminal region of the mind, the various "mechanisms" or characteristic methods by which the unconscious symbolically reveals itself, the opposed types of personality termed "extroverts" and "introverts," the process of "sublimation" or idealization of desire, and so on. These need not detain us. We shall observe some further details in a later chapter on "psychoanalysis," the medical aspect of Freudian psychology.

The theory arose in the realm of psychotherapy. Ere long, however, Freud not only became assured of the vast importance of his principles in explaining mental disorders, but was led to extend their application to other fields. He found that a multitude of incidents of normal everyday life, including dreams, lapses of memory and slips of speech, witty remarks, and inconspicuous bits of behavior were determined by unconscious motives precisely as were the psychoneuroses. Thus, to mention a few simple illustrations, the dream of being on shipboard signifies a desire for adventure; forgetting a name is the effect of unconscious antipathy to the person; jokes express in humorously acceptable fashion ideas which in their cruder form would invite reproof or contempt. Freud cites the case of a dishonest patient who said "I will *play* you by check," and gave him one which proved to be bad; also the instance of a man dropping a morsel of sweet food

from his fork just as he spoke of losing an official appointment.

In a larger way the history of art, of literature, and of religion showed the presence and power of the same subterranean forces. A great poem such as "Faust," for example, or the drama of Hamlet's inscrutable impulsiveness and hesitancy, proved in the light of his analysis to be the expression of unconscious motives which existed in the mind of the characters and more fundamentally in the mind of the poet himself. The phenomena of war fell under similar interpretation as the outburst of energies repressed by civilization. Still more recently Freud has sought to show that myth and ritual, totem and taboo, are explained as the symbolic manifestations of sex instinct. In fact the major dynamic underlying the advance of culture from its primitive forms to its most splendid modern achievements is the suppressed interest which, baffled in its first crude demands, finds at length a loftier and more durable satisfaction.

At first these novel doctrines made little headway either with the medical profession or with the public, but eventually they received wide acceptance. Leading disciples of Freud developed his theories, in some instances lessening their emphasis upon sex tendencies, attaching increased significance to a carking sense of inferiority, and to the instinct of self-assertion, and also seeking to establish a physiological basis for the new science. There are at present several distinct sects of Freudianism. A multitude of professional and amateur expositors have

taken up the theme, and have produced a huge literary growth of "Freudian psychology," analyzing all sorts of facts in Freudian terms and explaining them on Freudian principles. To many persons the ideas seem completely to have superseded the older psychology.

In the face of widespread appreciation we find several points of intelligent criticism directed against its hypotheses. First and foremost, critics declare that the notion of an unconscious intelligence, constantly and cannily striving to outwit the "censor," is a literary fiction rather than a scientific fact. Psychology has always acknowledged that past experience continues to work through subconscious depths of the mind, constituting our "apperceptions," coloring our emotional outlook, and directing our volitional energy. Psychologists are agreed, too, that this continued effectiveness of past experience operates by means of modifications of the nervous system. In other words the mind's action depends upon the mind's history, according to the physiological changes which that history has produced. To hypostasize this familiar truth into a mental entity called an "unconscious mind," which works according to the peculiar mechanistic formulas of Freudianism, is regarded as pseudo-scientific mythology. To this criticism Freudians reply that though the fundamental principle has long been known, its basic significance has not been recognized, and the precise technique of its operation has never hitherto been discovered. The unconscious mind with its mechanisms, they say, is a scientific

hypothesis which accounts for the accredited facts as no other hypothesis does.

A second line of criticism is directed at the conception of the suppressed wish. Granted that such struggling tendencies exist and that they form occasionally complexes, it is denied that they play so large a part in mental life as Freudian theory alleges. This applies particularly to the sex instinct, which, according to the critics, is greatly exaggerated as a determinant of conduct by psychoanalytic theory. The leading writers are said to be unduly influenced by the fact that the pathological cases which come to their professional attention are often of this character. As for the interpretation of everyday life, the development of culture, the productions of art, and so on, in terms of sex symbolism, it is largely nonsense, revealing nothing more than the expositor's prurience of mind. Much Freudian literature is outrageously indecent, but the true significance of its contents is not that human nature is essentially of such a character; it is rather that there are individuals, including unfortunately some popular writers, who have a taste for this sort of thing. To this criticism orthodox Freudians naturally reply that it only serves to illustrate one of their principal theses, namely the cultivated tendency to suppress frank reference to sex interests. The critic, they say, is merely voicing the censor.

In the third place, Freudian symbolism appears to lack scientific assurance. The symbols are often the only evidence of the alleged unconscious motive; the precise nature of the latter is inferred from its

supposed symbolic manifestations. Now symbolism is unquestionably a fact of human experience, and sometimes, as in religion, exceedingly significant. But whether a particular mental image, word, or act is a symbol, and if so just what it symbolizes, can be scientifically determined only by ascertaining its regular connection with the symbolized fact and discovering its hidden meaning. Symbolism is a mysterious art, and its interpretation a very dubious science. To say, for example, that the liking to be carried along in a crowd symbolizes a desire to return in infantile fashion to the protection of the maternal arms, puts a large strain on one's imagination. That apparently innocent thoughts and deeds really betray the presence of carnal desires seems like unclean literary fancy rather than scientific psychological fact. The point of criticism is not that there are no such symbolisms, but that in particular cases their suggestiveness, if indeed they have any, is decidedly uncertain.

Freudianism seems to the writer to be a mixture of scientific observation and explanation with crude metaphysics and deceptively imposing terminology. It gives a more explicit account of the determination of certain mental and physical phenomena than psychology has hitherto possessed. On the other hand some of its doctrines appear to be sheer fancy or the dignifying of insignificant facts by impressive nomenclature. In particular, as we saw earlier in the chapter, the "unconscious mind" is a highly questionable assumption. Its alleged behavior may be interpreted with at least equal clarity in terms of

neural habits and the known marginal and dissociated processes of the mind.

QUESTIONS AND EXERCISES

1. What kinds of experience originally gave rise to the idea of a self or soul with powers transcending the limits of consciousness?

2. From what religious and philosophical source did psychology historically derive the idea?

3. In what respects is the popular use of the term "subconsciousness" open to criticism?

4. What kinds of sensory and perceptual process may be called subconscious?

5. Show how the processes of memory, imagination, and thought indicate the existence of a subconscious realm of mind.

6. In what respect may feelings and emotions be termed subconscious? Show how this usage applies to mood, sentiment, and temperament.

7. What is "subvoluntary" action? Give several illustrations.

8. Name several kinds of abnormal phenomena which are commonly regarded as subconscious.

9. State distinctly the principal concepts of subconsciousness, with an illustration of each.

10. What kinds of subconscious fact may be regarded as essentially or primarily physiological? What are the objections to regarding all subconsciousness as purely neural process?

11. What kinds of fact illustrate the "marginal" type of subconsciousness? Show the difficulty of making this concept cover all the facts.

12. What is the "dissociated" consciousness? Indicate some normal and abnormal illustrations. What is "co-consciousness"?

13. State as explicitly as you can the conception of an

"unconscious mind." Why is this conception regarded as objectionable by many psychologists?

14. Show how the facts of "intuition" may be interpreted in terms of subconsciousness. How does this interpretation apply to "mind-reading"?

15. On what principle is the constructive application of the idea of subconsciousness based? Give illustrations of such application.

16. State briefly the general principles of Freudian psychology.

17. Give illustrations showing how the theory has been applied in different fields.

18. What are the principal criticisms of Freudian theory?

CHAPTER IV

SUGGESTION

Prevalence in Everyday Life.—Closely connected with the concept of subconsciousness is that of *suggestion.* In common usage this term signifies a hint, or idea only partially expressed. Psychologically, of course, we need a more carefully qualified definition; but the common meaning, as far as it goes, is essentially correct. As in the case of subconsciousness we find a semi-popular, pseudo-psychological use of the term which is vague, half superstitious, and which needs scientific correction. "Suggestion" is supposed to be a mysterious, almost magical power, by which all sorts of marvelous things are done in the way of controlling human beings. Even in scientific writing the usage is unsettled, and different aspects of the process are variously accentuated by different writers. Yet the process, though subtle and often complex, is perfectly natural, normal quite as much as abnormal, and analyzable into definite sensory, perceptual, associative, and ideo-motor elements. Before stating a formal definition let us consider some familiar illustrations.

(1) We have all observed that in childhood a bruise or scratch may be relieved by having some properly qualified person, usually the mother, "kiss

the place and make it well," and send the little sufferer forth to fresh exploits. Sympathy and distraction of attention, together with a limited therapeutical wisdom which finds no rational difficulty in accepting the treatment, results in a genuine "feeling better" state of mind. (2) With older patients the physician succeeds by professional look, tone of voice, mysterious medicine case and other appurtenances of his profession, quite as much as by actual prescription, in conveying the idea of recovery to the patient's mind, and thus helping to restore health. It is a notorious fact that a perfectly harmless "drug," such as colored water, may act as an emetic, and that a "placebo" may produce at least temporarily the sense and reality of relief from pain. (3) The advertiser's suggestions of bargains and of special values such as the strength, durability, and elegance of an article may be more efficacious than explicit description or argument. Thus pictures of sumptuous interiors help to sell furniture, and the "marked down" tag attracts the purchaser by its suggestion of cheapness. (4) In like manner during the late war cleverly designed posters hurled their suggestions of the duties of patriotism at a susceptible populace. (5) In the court room the skilful attorney suggests to the witness the bit of evidence which he desires to elicit, and often obtains a favorable verdict from the jury quite as much by suggestion as by proof. (6) Orators artfully implant in the minds of their audiences ideas which they are too shrewd to express in literal form, as Mark Antony accomplished his vindictive purpose without openly

declaring it. (7) How effective, too, are innuendo and sarcasm in conveying an idea of contempt which they do not expressly state! Some speakers are characteristically and habitually "suggestive" in their public and private discourse. (8) Beggars impress their needs upon the passing throng, clumsily but not without success, by their ragged clothing, whining voice, and forced facial expression of suffering. (9) Play, from the dolls and housekeeping and Indian fights of childhood to the finest dramatic art of the metropolitan stage illustrates the working of a suggested idea. (10) Wit and humor are effective through what they hint but do not openly say; jokes lose their point when baldly put. (11) Dreams owe their strange form to internal or external suggestions—a cold draught, a strained muscle, a suppressed worry—which starts an elaborate process of fantastic amplification. (12) Finally we may note that religious observance is imposed upon us from our childhood to our maturer years by the subtle impressiveness of the church, the sacred book, priestly garb, hymn, prayer, and creed. In all this there is, for the average person, little that is explicitly rational. The religious mind is preëminently a product of authoritative suggestion.

Daily life, in short, is constantly filled with all sorts of suggestions. Great ranges of experience such as education, politics, art and religion, owe their form largely to this factor. Were we to seek further illustrations in the phenomena of abnormal mental life, e.g., mental disorders of one kind and another,

we would discover a multitude of striking facts. But those already enumerated serve our present purpose, so we may proceed to inquire just what is the common characteristic which entitles them all to the same designation.

Psychological Definition of Suggestion.—The essential features of the process may be stated psychologically as follows.

(1) Suggestion is the arousal of an idea or tendency to action in the mind. Suggested ideas range from mere bits of mental imagery to elaborate concepts, and suggested actions may be specific deeds, systems of conduct, or the general attitude of belief. The term is applied indifferently to the idea or tendency to action and to the process of arousing it. In so far suggestion is simply the stimulation of mental process.

(2) The process of accepting and acting upon the idea is *automatic* rather than rational; i.e., it is carried out by the sensory, associative, inhibitory, and ideo-motor mechanism of the mind without the consideration of reasons for the belief or action. Where reasons are included in the process, independent rational evaluation of their real significance is lacking. Suggestion is thus the automatic mental response to stimulation.

(3) The process is essentially *subconscious*. The stimulation may work (a) merely through the margin of consciousness without focal awareness; or (b) focally, but with marginal features, intensified force or amplification; or (c) focally or marginally through a dissociated center of consciousness.

Marginal suggestion, (3a), is illustrated by the way in which we unconsciously pick up a tune which someone is singing, or by our mechanical looking at our watch when the person beside us looks at his, or by our dimly felt responses to the smile of a friend. In such cases our mind may be intent on something else, our book, our thoughts, or our friend's words, yet we marginally perceive the suggestive stimulus and react accordingly. Sometimes, indeed, the process is distinctly facilitated by concentration upon something other than the suggested idea.

Focal suggestion with marginal elaboration, (3b), appears, for example, when the dinner bell arouses us from study, or when words of sarcasm produce in us the feeling that we are held in contempt. This is the common type of suggestion, and the meaning of the term as it is used in ordinary discourse. "I suggested that he see a doctor" signifies that the speaker implanted the idea in the other person's mind sufficiently so that the latter worked it out to the point of action. The amplification may be merely the deepened feeling of the force of the suggestion, as past experience subconsciously adds its weight to the idea, or it may lead to a more rational process of elaboration in detail, i.e., the consideration of just why one should consult the physician. In either case it is the marginal intensity of the idea which constitutes its suggestive character.

The third type of suggestion, (3c), is illustrated by the queer events of dreams, by the strange behavior of hysterical patients in reaction to chance stimuli, and by commands given to hypnotic sub-

jects. It is not essentially different from the two preceding types, but the mental dissociation of the individual accentuates it peculiarly.

The term suggestion is very loosely used, often in a way which makes it coextensive with all communication. In order to define and clarify the use appropriately we should contrast the process with that of reasoning and argument. Suggestion is automatic or mechanical in its working. This statement involves two qualifications, however. First, the form of argument may be used with suggestive force even though the reasoner does not understand the reasoning. In general we have been taught that "reasons" are to be accepted and obeyed, and this docility to reason may exist quite independently of clear understanding. Thus little children will sometimes accept absurd or untrue reasons simply because the latter have apparently rational form, and they themselves have not yet attained critical power of evaluation. And the same suggestibility is present in older persons with regard to matters with which they have no studied acquaintance. Argument about unfamiliar subjects seems more weighty than it really is. Even scientifically trained minds are deceived by unsound reasoning in fields other than those of their special training. Here, however, the process of suggestion shades into direct, or non-suggestive communication. Secondly, the suggestion when received may be rationally developed in the mind, so that the term properly applies only to the initial stage of the process. We may suggest the desirability of membership in a club, or of contribution to a philan-

thropy, and then leave the other person to "think it over."

Further, we should distinguish suggestion as clearly as possible from the process of ordinary communication in which the communicated idea is presented focally, as in ordinary information and exposition. Suggestion, as we here use the term, works with a greater measure of marginal process, and it is this relatively *sub*-conscious character which is implied by the etymology of the term. Though there is no sharp difference between the two types of communication, and there are plenty of ambiguous and border-line cases, we may nevertheless adopt a practical distinction between the ordinary process of addressing ourselves openly to the attentive mind, and that which is characterized predominantly by subconscious factors.

Gathering the foregoing considerations into a definition, we may say that *suggestion is the process of arousing in the mind an idea or tendency to action which operates mechanically and non-rationally by its subconscious character.*

Special Forms of Suggestion.—Within the general idea as thus defined certain specifications are noteworthy. In the first place there are suggestions of *belief* and suggestions of *action*. One may accept a political view from mere association with political partisans, and yet fail to come to the point of casting a vote. On the other hand one may be moved by suggestion to vote for a measure in which he has no faith. Ordinarily, however, belief and action go together. Belief, indeed, may be regarded as a general

mental preparation for action, and action generally presupposes belief.

Next we should distinguish between *focal* and *marginal* suggestion. Sometimes the suggested idea or deed is presented in such a way that the attention is fixed upon it. Thus commands, counsel, and information work directly upon the center of the field of consciousness, though their suggestive force is due to their marginal character. Other suggestions enter the mind by a distinctly marginal door. They are dimly felt rather than clearly perceived. We close a window to escape a draught without relinquishing the problem upon which we are meditating; or induce a child to take medicine by emphasizing the desirability of getting well or of pleasing mother. But here again, of course, the two forms intermingle. Focal suggestion possesses marginal force, since the "meaning" of any idea is found largely in the fringe of consciousness; and, counterwise, a marginal suggestion is usually grasped with a transitory flicker of attention.

The distinction between *direct* and *indirect* suggestion is closely akin to the foregoing. Direct suggestion is focal. Indirect suggestion is implanted marginally, as an implication of what is said or done. We indirectly suggest charity by dwelling on the suffering of the poor, or suggest purchase by extolling the merits of an article.

There is also a difference between *normal* and *abnormal* suggestion. Our illustrations have been of the former sort. The differentia of abnormal suggestion are mainly two: first, increased suscepti-

bility, both focal and marginal, with lessened resistance to the suggestion if it is unwelcome; and second, a tendency toward the operation of a dissociated center of consciousness. Extraordinary emotional excitement, mental diseases of one kind and another, extremely concentrated attention, and the condition of hypnosis offer many illustrations of abnormal suggestibility. The hypnotized subject accepts almost any idea with docility, persons in a crowd often lose their rationality and self-control, the absent-minded man does things quite foreign to the course of his thought, and so on.

A special form of suggestion, of great practical importance, is that termed "autosuggestion," i.e., the introduction of an idea into one's own mind. The process may be intentional or unintentional, and in its automatic and subconscious character it is like suggestion practised upon other persons. One may suggest hope or despair to himself by persistent imagination or appropriate words. We may convince ourselves of the need of new clothing, of a new house, or a new automobile, by merely dwelling on the idea and refusing to recognize opposing considerations, until at length we purchase the thing in question. Much ill health is a matter of autosuggestion; this applies especially to nervous disorders. In a less serious way sleep and sleeplessness may alike be the product of expectant attention. Neurasthenic fatigue is a notable illustration. "How tired I am"—the words or thought serve to lodge the feeling in the mind until it becomes almost irremovable. Certain religious sects habitually practise

autosuggestions of health; others cultivate a more general attitude of cheerfulness, strengthening themselves in the process by scripture reading, meditation, and prayer. Hypnotic trance may be induced by autosuggestion, and many insane delusions are essentially of this type. In general whatever may come as a suggestion from others may also be self-imposed. Usually the two forms of suggestion cooperate: the individual imparts the idea to himself quite as much as he accepts it from another.

Further, let us observe the interesting phenomenon called "countersuggestion," i.e., the reaction to a suggestion in just the opposite way to that intended. Requests bring prompt refusals, expression of opinion provokes instant dissent, the spectacle of joy in others arouses gloom in the observer, the mere prospect of anything inclines one to want or to do something else. In legislative bodies the bare proposal of a measure is sufficient to arouse hostility in certain minds. The salesman's art has the effect upon some customers of making them cautious, skeptical, disposed to postpone purchase or look further. Apparently everybody is more or less countersuggestible, showing the trait at certain times, under particular conditions such as fatigue, or toward certain persons and subjects. Many children pass through a stage of development markedly characterized by it, a negative, disagreeable, cantankerous period in which docility seems utterly lacking. A few persons appear to be persistently and predominantly in this antagonistic frame of mind, always disposed to object and to criticize, just

as others are naturally inclined toward acquiescence and the acceptance of whatever suggestions come their way. Probably the varying ease with which different persons can be hypnotized depends at least in part upon this countersuggestible trait of mind.

Finally, there is an important type of phenomenon which may be termed "social suggestion." Here the suggestion comes not from any one person but from many, whose common belief or action, by its very prevalence, imposes itself upon those who come in contact with it. The most striking illustration is the "mob mind," possessed by passion, spreading like a wave, engulfing all who come within its reach. Persons of intelligence and culture are not unlikely to lose their rational self-control in the excitement of the mob, to accept whatever suggestions happen to fall upon them, and to act accordingly, even though such action is foreign to their normal self-possession. City crowds of all sorts exemplify social suggestion, as also, on occasion, do political bodies in the heat of partisan debate or patriotic fervor, and religious congregations, especially those of the "revival" type. It appears on the various levels of animal life, as in the panic of flock and herd, the stampede, and the mad rage of those species which hunt and kill in groups. Social suggestion of a less conspicuous kind is found in the common opinions held by people of the same class. Ideas and feelings come subtly from one's associates on a basis of birth, wealth, caste, or occupation. Education and environment, political and religious grouping, city and country conditions of life produce by mere personal

contact innumerable resemblances of thought and act. The teaching is not the work of one, but of many, though a single agency, such as a newspaper or a popular leader, may be especially effective in spreading it. In any case the distinguishing fact is the social atmosphere in which manifold currents of opinion, and emotion blow constantly upon the individual, who responds to them oftentimes with as little explicit consciousness of their operation as of the air he breathes. How many of your own opinions in politics and religion are pure products of your reason? Are not most of them partially due to the informal teaching of the family, class or sect to which you belong?

Conditions of Suggestibility.—Just what are the conditions which facilitate the process of suggestion? The fundamental one is a certain state of mind which we may designate as *blankness,* a condition which is generically that of the margin of consciousness, though it has various special forms and is produced in various ways. It is the condition of mental dullness characteristic of fatigue and sleep. Persistent fixation of the attention tends to produce it, as does physical relaxation, and the use of narcotics. "Abstraction" or concentration upon a point leaves the outlying part of the mind open to suggestive attack. Excitement diminishes one's critical intelligence to such a degree that suggestion takes place with uncommon ease. Deficiency of knowledge concerning a suggested idea renders a person more susceptible of belief in it; we swallow information the more readily if our own learning is not of that

sort. This mental blankness, whether belonging to excitement or passivity, affords an easy access to stimuli since it does not contain the springs of inhibition which operate on higher levels of consciousness. The processes of rational criticism, restraint, and self-control do not take place or are suppressed, and ideas take possession of the mind with little or no difficulty.

The *intensity* of the suggestion is likewise an important condition, varying in special form. It may result from the intensity of the stimulus, or from the repetition of it, or from the general impressiveness of its source. A loud knock at the door is more effective than a fainter one. A stern command is instantly obeyed. Invitations from the eminent are equivalent to commands. Scientific "authority" in any field is accepted without question. The sacredness of the Bible demands at least the appearance of respect. "Prestige" in its various forms is a prevalent condition of suggestion, as is shown by the fact that all of us respect the policeman, clergyman, superintendent, mayor, and judge because these persons are clothed in the garb of authority or are known to be invested with power. Children accept information and command from their elders because of their natural subordination to the dignity of years, as well as to superior size and strength. In hypnosis the authority is in general limited to the particular hypnotist, so that only his suggestions are received by the subject—the phenomenon termed "rapport."

As the preceding illustrations have shown, sug-

gestibility depends in some degree upon *age* and *temperament*. Children are naturally suggestible except in so far as their growing knowledge and self-assertiveness modify the characteristic. Persons also differ in their inborn disposition to accept or reject suggestions; some are docile, others obstinate and "countersuggestible" by nature. There are sex and racial differences, though these are more subtle and complex than is ordinarily supposed. Women are more suggestible than men in certain respects, clothing for example; with regard to some other matters apparently less so. Some groups and races show a higher degree of social suggestibility than others, but in general these differences reduce to the more fundamental one of mental blankness. Suggestibility implies a lack of the intellectual basis of dissent. The negro is probably not more or less suggestible than the white except in so far as deficiency of culture renders him more susceptible to suggestions of certain kinds or from certain sources.

The Art of Suggestion; Hypnotism.—It is obvious that suggestion is exceedingly useful in daily life, and that the method of practising it skilfully constitutes an important question for applied psychology. Suggestion is the natural or acquired art of the teacher, manager, advertiser, salesman, lawyer, physician, and clergyman. Likewise in the unprofessional life of the home and shop the method of securing ready belief and action without resort to the uncertain processes of argument is often desirable. Persons in charge of affairs may be excused for thinking that their primary function is not to

give reasons but to get things done. To present an idea, properly reënforced by suggested authority, sympathy, assurance, or fear, to command with sternness or reiterate with suavity, in other words to play shrewdly upon the mental mechanism of associates and subordinates is evidently a most valuable accomplishment. In some it is a natural gift; their subtle manipulation of the motive forces of human nature so as to obtain ends which are not openly or fully indicated seems to the rest of us almost uncanny. Others may learn the art, however, and honestly practised it is an art well worth time and patience in study. We shall note further illustrations of it in the fields of education, therapeutics, and business, in the chapters which follow.

Hypnotism was formerly regarded as the art of suggestion *par excellence,* and though its practical value has proved to be less than was supposed it nevertheless is significant because it exhibits the phenomena of suggestion in extreme form. In hypnosis the subject's mind lacks for the time the normal functions of synthesis, rationality, and self-direction, and becomes helplessly passive and docile. The state ordinarily begins with a mental blankness which is reached sometimes accidentally, sometimes artificially, by various processes of concentrating attention, dispelling mental content, relaxing the muscles, and suppressing mental and physical movement. The result in any case is a more or less extensive "dissociation" or annulling of the higher functions of the mind, and restriction of its content to what is directly in focus. In consequence the hypnotized

person accepts from the hypnotist all sorts of suggestions, almost without question.

The characteristic phenomena of hypnotic suggestion are various. Some are muscular, resembling paralysis, as for example the inability to open the eyes or move hands or feet if told that the movement is impossible. On the other hand the muscular rigidity called "catalepsy" may be produced in astonishing ways, as when the subject holds his arm outstretched and motionless without effort for an hour or more, or lies face up with the back of his head on one chair and his heels on another. In the field of sense perception he accepts suggestions to the extent of becoming apparently quite unable to see, hear, or otherwise sense objects, so completely do the normal sense functions become dissociated at the command of the hypnotist. Particular persons are ignored as though invisible, the pungency of ammonia stimulates no more reaction than odorless water, and so on. Yet the same subject's sensitivity may become "hyperesthetic," i.e., so extraordinarily sensitive to faint stimuli that he performs with assurance feats of vision and hearing which are normally impossible. All sorts of illusions and hallucinations may be produced, with appropriate behavior in every case—a cringe of pain at the touch of a desk designated as a red hot stove, conversation with an imaginary person, and the playing of any part from the President of the United States to an automobile or a doormat which is suggested as the subject's real character. In complete hypnosis the operator's commands are obeyed without question except when they run

counter to deep convictions or early moral training, in which case they may be resisted strongly and may even result in waking the subject from the hypnotic state.

In hypnosis memory may be extraordinarily detailed and precise, quite exceeding the normal capability of recall; though here as in the phenomena of hyperesthesia the hypnotized person's report is easily colored by suggestions unwittingly given by the hypnotist. Upon emerging from the trance, however, the subject has in general no recollection of what happened; in fact this "amnesia" is regarded as an essential symptom of the state. Yet, strangely enough, the peculiar phenomena of "post-hypnotic suggestion" show that some kind of subconscious memory persists. Anesthesia to a particular stimulus, say the smell of liquor, may be more or less permanent; encouragement and prohibitions given in hypnosis may continue effective long after the subject has regained his normal consciousness; directions, to be executed subsequently, are carried out on time and with precision, in some instances after a long interval. The most plausible explanation of these facts is that a slight degree of hypnosis continues or reappears later in accordance with the hypnotist's instructions.

Hypnotism is less dangerous than was formerly supposed, both because of its natural limitations in point of suggestibility and because the induction of it in general requires the coöperation of the subject. It does not necessarily "weaken the will" except in relation to a particular hypnotist. As a criminal

agency it is regarded by authorities as practically negligible. The principal danger, in fact, is that some nervous shock, haunting fear or distressing idea, will be unintentionally suggested by an untrained operator. For this reason no one ought to experiment with it unless he has been scientifically trained to do so.

The practical usefulness of hypnotism is limited almost exclusively to the field of psychotherapy. As a means of perfecting the memory of witnesses or of eliciting a confession of crime it is practically worthless, since the subject's statements are almost inevitably affected by the operator's suggestions, and hence are unreliable. Its principal application is to psycho-neurotic disorders such as abnormal fears, obsessions, and evil impulses, which may be lessened or removed by the method of posthypnotic suggestion. It is a most important agency in dealing with cases of alternating personality. On the other hand it is not easily applicable to some persons, and its effects are not always lasting. For practical purposes it is being superseded by other forms of suggestion, especially autosuggestion, which work upon the mind in more normal ways.

One of the most important applications of suggestion lies in the field of social phenomena. This is the art of "propaganda" which has become so prevalent in recent years. The extension of democratic power and the necessity of winning public approval for various causes, together with the development of means of public information and appeal, especially in printed form, have given rise to deliberate

methods of lodging ideas, emotions, and tendencies to action in the popular mind. Such propaganda may be political, economic, or religious. It may aim to inflame a nation with hatred of another, to prejudice the public for or against one party in an industrial dispute, to win adherents to a particular sect, and the like. It is the recognized means of forcing a legislature to take action. During the great war it was employed with perfected skill to excite patriotism and to discourage the enemy. Every one of the leading governments involved had its highly organized agencies for disseminating in the public at large, both in its own country and in others, such ideas as it thought needful to maintain popular and military morale, or to disintegrate that of its foes.

The distinguishing features of propaganda, which entitle it to be regarded as an art of suggestion, are its combination of assertion and accusation, more or less accurate information, incomplete or fallacious reasoning, and in general its one sided appeal to feeling and intelligence. At its worst it descends to the level of deliberate deception. Newspapers, pamphlets, books, posters, public addresses and the like have their respective forms of suggestive cogency. Especially effective are the newspapers with their impressive headlines, accentuation or suppression of the news, and cleverly partisan editorials. The real merits of an industrial question may be obscured, and the issue of a strike determined, by control of the daily and weekly press by which public sympathy and support are unfairly aligned. Propaganda

is becoming a questionable, not to say disreputable art, because of the intentional deception which it sometimes involves and the injustice to which it leads. Many students of public affairs think that one of the greatest needs at the present time is the development of an authorized agency of public information, the reliability and fairness of which cannot be questioned.

QUESTIONS AND EXERCISES

1. Indicate several illustrations of suggestion as it is practised in everyday life.

2. How is suggestion defined psychologically? What are its principal types?

3. How is suggestion related to argument? How does it differ from ordinary information or communication?

4. Distinguish, using illustrations, between suggestions of belief and of action. Between "focal" and "marginal" suggestions.

5. What is "abnormal" suggestion? Give several illustrations.

6. What are "autosuggestion" and "countersuggestion"? Illustrate each.

7. What is "social suggestion"? Give illustrations showing the working of suggestion in different forms of social group.

8. What are the principal conditions of suggestibility?

9. Mention several different kinds of "mental blankness" which facilitate suggestion. What is the general relation of education to suggestibility?

10. Give several illustrations of the effectiveness of "prestige" in suggestion.

11. Why are children especially suggestible?

12. Show how a public speaker may make use of suggestion.

13. Show how religious services are characterized by suggestion.

14. Describe briefly the general character of hypnosis, showing its relation to suggestion.

15. What is "propaganda"? Indicate the suggestive features of the propaganda used in war.

CHAPTER V

THE MEASUREMENT OF INTELLIGENCE

The Nature of Intelligence; Individual Differences.—The most energetic movement in psychology at the present time is the effort to measure mental processes with precision and to classify individuals according to such measurement. This effort is interesting and significant not only with respect to the concept of human individuality, but also for practical purposes. Much improvement is expected, and in fact already attained in some degree, in education, industry, pathology, and other departments of human affairs, by ascertaining with scientific accuracy the extent of the mental powers which differentiate persons.

The mental traits thus subjected to investigation are for the most part those of intelligence, including both its constituent functions such as sensory acuity, memory span, association time, and the like, and also its complex processes of operation, as in following complicated directions and solving problems. Emotional and volitional characteristics are less easily measurable, though even here there has been some advance toward precision. Not only can the physiological accompaniments of emotional states be recorded with the aid of apparatus, but lately

psychologists have begun to study individual traits of emotion and volition in such a way as to facilitate the definition of personal character. The functions of intelligence, however, both in their simple and in their complex forms, have proved to be most susceptible of numerical statement. Investigators have constructed ingenious scales for determining degrees of ability, and the results have been put to various uses. The literature of the subject has assumed such huge proportions and so technical a character as to constitute a separate branch of psychology.

If we ask just what is the "intelligence" which is thus measured, the answer may be given in two ways. We may define intelligence in terms of its constituent processes, that is to say as the mental functions of sensation, perception, association, memory, imagination, the formation of ideas or concepts, judgment, and inference. Analytically these may be reduced to certain typical or fundamental forms, namely sensation, association, and judgment. Sensation reports the qualities of the outer world and the condition of our bodily organism. Reproductive association appears in perception, memory, imagination, and thinking. The essential character of rational thought, however, is more than mere association; it is found in the peculiar process of judgment and its dependent processes of conception and inference. The selection and relation of facts not simply because they *come* together but because they *belong* together is the exercise of a higher function of mind. Intelligence may be regarded as the quick-

ness and accuracy with which these processes work both in the ordinary affairs of life and in those which call for expert intellectual efficiency.

Again, we may construct a definition of intelligence in terms of its effectiveness. The definitions current in educational literature emphasize as its peculiar characteristic the ability to adapt oneself to new conditions, to act appropriately in a novel situation, to deal successfully with difficulties, to solve problems, and so on. The situations to be dealt with, and the corresponding tasks of intelligence in dealing with them vary in complexity all the way from the repetition of a short sentence or the following of simple directions to the solution of theoretical and practical problems which call for highly technical reasoning. The point of the definition is that it distinguishes between intelligence as an *adaptive* function and the unadaptive processes of habit, conventionality, and custom. Any creature is intelligent in the degree in which it can plan and execute an effective reaction to unfamiliar conditions.

This ability is essentially related to the kind of subject matter with which it deals; in other words there are different kinds of intelligence. Everyone has observed that a pupil who does well in one study in school may do poorly in another, not necessarily because of lack of industry or even of interest, but rather by reason of some natural or acquired ineptitude. Similarly a man may be a first class mechanic but an indifferent foreman, or conversely he may be less skilful than the subordinates whose work he directs with success. One may write scholarly books

or administer the affairs of a corporation, and yet be unable to adjust the machinery of his automobile.

Of these various kinds of intelligence four are especially noteworthy, namely the *mechanical,* the *social,* the *esthetic,* and the *abstract* or "intellectual" intelligence. The first works skilfully with tools and machines; the second regulates human relationships in the home, the school, the church, political life, and the business world; the third constructs objects of the artistic imagination; and the fourth devotes itself to the "learning" in books or the scientific study of nature. They are not entirely distinct, of course; they shade into one another, and characterize individuals with different degrees of versatility. Each of them includes many subordinate species, among which there is more or less variation. A man may be a better carpenter than machinist, a good lawyer but a dubious judge, a skilful politician but a poor executive, a musician but not a poet, a reliable historian though incapable of higher mathematics. In any field he may show more or less initiative or constructiveness, more or less accuracy or "judgment." In general, however, one's intelligence is approximately the same in the different parts of a main field, while it varies more widely between one main field and another. Doubtless most persons possess all kinds in some measure, but now and then we find someone who is distinctively excellent, perhaps in some respect even a genius, while displaying no more than average intelligence along other lines. To what extent these personal characteristics are inborn and fundamental,

and to what extent superficial and due to accidents of environment and education, is a further question. Certainly they exist, and their existence carries the implication that the measurement of intelligence is always of some one kind, and that its results are more or less but never absolutely significant with regard to other kinds.

The more carefully we examine the nature of intelligence the more clearly we find *individual differences.* The various mental functions, sensory, associative, and rational, operate in a wide range of degrees of efficiency, each degree characteristic of the person possessing it. "Bright, average, and dull" is of course merely a convenient classification. The percentages or other grades attached to school performance are only a little more exact. More accurate measurement reveals a multitude of slight differences in capacity, differences of acuity and rapidity, of direction and complexity of mental processes. Though the general complexity of intelligence is so great that for the most part we cannot ascertain its dimensions with reliable precision, it is a significant fact that the more thoroughly we analyze its functions the more distinctly we discover that it, like the rest of nature, is "a matter of infinite diversity."

To some extent these differences are the result of training, including experience in home and school, in play and work, from infancy onward. But to an equal extent they are inborn. Fundamentally, perhaps, they are due to native variations in the structure and functioning of the nervous system.

They come to light gradually with advancing years of childhood and youth, and are the basis of education. What one learns and what one accomplishes in life depend upon the development of personal capacities, but quite as much do they depend upon the original nature and extent of these capacities. Hard work will raise mediocre ability to a level ordinarily reached with ease by a more gifted person, but the latter will always have possibilities of achievement which the other cannot attain. This aspect of the matter is significant in that it justifies the effort to construct scales of measurement which reach the fundamentals of intelligence. To ascertain what these are in their respective degrees and to direct the individual accordingly are most important aims of contemporary psychological science.

The Development of Intelligence Tests.—Methods of measuring intelligence, or "intelligence tests" as they are commonly called, are a combination of various features found in scholastic examinations, ordinary "information questions," intellectual and practical "puzzles" of different kinds, and certain forms of psychological experimentation performed with or without the aid of apparatus in the laboratory. Ingenious devices possessing these features are put in the form of definite tasks and problems, and are applied experimentally to large numbers of individuals. The results are interpreted by means of the mathematical concepts used in the statistical researches of anthropology and sociology. The aim of the effort is to formulate and apply standards of intelligence so as to determine with precision the

efficiency of the individual or the general level of capacity in a group.

The contemporary development had its principal origin in the remarkable work of a French psychologist, Alfred Binet, who with a collaborator constructed the famous Binet-Simon system of intelligence tests. This cleverly devised psychological tool served to measure the "mental age" of French school children, and thereby to indicate not only how far the intelligence of a particular child diverged from the normal, but also whether such dullness as appeared in school work was due to inborn inability to learn or to less fundamental factors of disposition and environment. The system as formulated by Binet included a set of tests for every year of childhood from three to ten, and further sets for the ages of twelve and fifteen and for adults. There were five tests in each set except for the fourth year, which had only four. At the age of three, for example, a normal child is able to point to nose, eyes, and mouth; repeat two digits; enumerate objects in a picture; give family name; and repeat a sentence of six syllables. At six he should distinguish between morning and afternoon, define familiar words in terms of use, copy a diamond, count thirteen pennies, and distinguish pictures of ugly and pretty faces. The tests for age ten were to arrange five blocks in order of weight, copy drawings from memory, criticize absurd statements, answer difficult "comprehension questions," and use three given words in not more than two sentences. The material of the tests, such as pictures to be

described, words to be defined, figures to be copied, questions to be comprehended, and so on, was of course selected methodically and with the greatest care. Precisely here, in fact, lay the scientific genius of Binet and the resulting value of the method. The tests were aimed at typical or fundamental operations of intelligence.

Their application spread rapidly as a feature of educational science and practice. They were quickly adopted in this country, and were revised by several investigators to conform to American conditions. The "Stanford Revision," an elaboration of the Binet-Simon system with original additions by Professor Terman and his associates at Stanford University, is the one commonly used in American schools. It includes sets of tests for the years from three to ten, for twelve and fourteen, and for average and superior adults. Since it frequently happens that a child fails in part to do the tests corresponding to a particular year but is nevertheless able to do one or another in a more advanced set, each test in a set is equated to a certain number of months, so that by a simple process of addition and subtraction the investigator can calculate with exactness the "mental age" of the subject. As an illustration of the evolution of the method we may observe the tests for age six in the Stanford system.[1]

YEAR VI. (6 tests, 2 months each.)
1. Right and left (No error.)
   Right hand; left ear; right eye.
2. Mutilated pictures. (3 or 4 correct.)
3. Counts 13 pennies. (1 of 2 trials, without error.)

[1] Terman, *The Measurement of Intelligence*, p. 57.

4. Comprehension, 2d degree. "What's the thing for you to do":
   (a) "If it is raining when you start to school?"
   (b) "If you find that your house is on fire?"
   (c) "If you are going some place and miss your car?"
5. Coins. (3 or 4.)
   Nickel; penny; quarter; dime.
6. Repeats 16 to 18 syllables. (1 of 3 absolutely correct, or 2 with one error each.)

Al. Morning or afternoon.

Many other systems of tests have appeared, some for general use in connection with school work, some for application with reference to special purposes. There are tests for the selection of supernormal children, tests to determine different kinds of vocational ability, tests for various subjects in the school curriculum, tests for admission to college, and so on. Especially noteworthy are the two systems of tests which were given to soldiers in the American army during the Great War, the "Alpha" for those who could read English, and the "Beta" for foreigners and illiterates. These tests, devised by a committee of the American Psychological Association, proved of great value in detecting individuals who possessed insufficient intelligence for the work of a soldier, and those who were best fitted for advancement to officer's rank. The Alpha tests consisted of eight groups of different kinds: following directions in tasks which could be done with pencil and paper; doing examples in arithmetic; distinguishing between good and bad reasons for statements; deciding whether certain pairs of words were of the same or of opposite meaning; rearranging a series of words so as to make a sentence and telling whether it was true or false; completing series of numbers;

supplying words the meaning of which was suggested by analogy; and giving information about familiar subjects. Each test consisted of a number of parts, from twelve to forty, graduated in difficulty. The following illustrations are taken from the upper range of difficulty:—

Test 1. Directions. (Twelve parts.)
No. 8. O O O MILITARY GUN CAMP
Make in the *first* circle the *last* letter of the *first* word; in the *second* circle the *middle* letter of the second word, and in the *third* circle the first letter of the *third* word. (10 seconds.)
Test 2, Arithmetical Problems. (20 problems, 5 minutes.)
No. 16. If an aeroplane goes 250 yards in 10 seconds, how many feet does it go in a fifth of a second?
Test 3. Practical Judgment. (16 examples, 1½ minutes.)
Which is the best answer to the following question?
No. 13. Why should a married man have his life insured?
Because ——— death may come at any time ——— insurance companies are usually honest ——— his family will not then suffer if he dies.
Test 4. Synonym-Antonym. (40 pairs, 1½ minutes.)
Are the following words of the same or of opposite meaning?
No. 30. immune—susceptible
Test 5. Disarranged Sentences. (24 sentences, 2 minutes.)
Think of what the following sentence would mean if the words were rearranged in the right order, and tell whether it is true or false.
No. 22. forget trifling friends grievances never
Test 6. Number Series Completion. (20 series, 3 minutes.)
What two numbers come next in the following series?
No. 14. 18 14 17 13 16 12 ....
Test 7. Analogies. (40 cases, 3 minutes.)
Which one of the last four words has the same relation to the third word that the second does to the first?
No. 27. clothes—man :: hair—horse comb beard hat
Test 8. Information. (40 statements, 4 minutes.)
Which one of the last four words makes the truest sentence?
No. 22. Denim is a dance food fabric drink

The foregoing tests presuppose ability to understand spoken and printed English. Instructions for doing each successive test were given with military precision, and answers for the most part took the

form of figures, or lines drawn under certain printed words. In the Beta tests instructions were given by example and pantomime, with a minimum of language, and the tests themselves contained no words, but consisted of drawing lines through mazes, checking numbers, pointing out the missing features of pictures, and other performances of the same general character.

There are many other particular forms of intelligence test, too many in fact to enumerate in detail. In addition to those already indicated we may mention the following as especially noteworthy because of their common use or practical value.

Form board: fitting blocks into holes of corresponding shape.

Geometrical construction: putting together the separated parts of a square, circle, triangle, and the like.

Substitution of letters or other symbols for figures, or the converse.

Discrimination between words of somewhat similar meaning, for example "plutocrat" and "autocrat."

Extent of vocabulary, as indicated by comprehension of words in a selected list.

Completion of sentences from which one or more words are omitted, e.g., Public sentiment . . . quickly . . . . . of excitement.

Statement of principal ideas in a passage read or heard, such as a paragraph of an essay of more or less abstract character.

Logical conclusions, e.g., If A is larger than D, C

is smaller than B, and B is not smaller than A, what is the relation between D and B?

Association tests are peculiarly important. They are of various forms. A list of words may be given, to elicit the first word which comes to mind in each case;—this is "uncontrolled association." Or, by "controlled" association, a special type of response may be called for, such as words opposite in meaning, or coördinate, or indicating such relations as part-whole, genus-species, and cause-effect. Thus "sick" may suggest the name of a person or a disease, or "well," or "medicine," or "die," or any other idea of fact habitually connected with illness. Since the associative process is especially fundamental in the activity of the mind its operation as thus tested may be profoundly significant of the ideas and purposes which constitute a person's character, or of what he knows about some particular matter. The length of time taken to produce an associated word is normally from one to three seconds; if this is prolonged it usually indicates inhibition or "blocking" by some obscure factor—unpleasant memory, fear of accusation, and the like. Bodily reactions such as accelerated breathing, blushing, trembling, and nausea are also indicative of mental content. Hence, as we shall see later, adroit use of association tests may serve to bring to light the hidden causes of mental disorder. They also have a possible bearing on the detection of crime, since guilty knowledge automatically tends to betray itself in associated forms of speech.

There are certain classifications which are especially significant in the science of mental measurement. In the first place there is a distinction of importance between *individual tests,* given to one person at a time, and *group tests* which may be taken by a large number simultaneously. The Binet tests are of the former sort; the Army tests of the latter. Since social environment may be a factor in the exercise of intelligence, and since in particular the sense of personal relationship may be peculiarly effective, both kinds of test have their respective characteristics and merits. A second distinction is that between *language tests* requiring the subject to read and speak or write words, and *performance tests* which call only for such responses as drawing lines, checking figures, and manipulating articles. The fact that intelligence expresses itself both in speech and in other forms of activity, and also that persons differ considerably in this respect, gives significance to this distinction.

Most important is the difference between tests of *general* and of *special* intelligence. The former, as illustrated by both the Binet and the Army systems, presuppose that intelligence is a general function, applicable to an indefinite variety of situations and problems, and that the different parts of the test, taken together, indicate what the individual may be expected to do, i.e., how effectively he will act under any conditions which are likely to occur. If his general intelligence is high, he will be able to deal successfully with all matters except those which call for highly specialized or trained abilities

such as artistic gifts and muscular skill. Special tests, on the other hand, have reference to some more or less definite purpose, some particular kind of task. There are systems of special tests for musical ability (Seashore), for the selection of aviators, and for various industrial occupations.

The development goes on apace. Not only does the work of mental measurement constitute an ever-expanding field of psychological and educational science; in some instances it has almost taken possession of school work, not wholly to the advantage of the latter. Some minds find a fascinating interest in this sort of thing, and their energetic efforts are facilitated, for better or worse, by the helplessness of children in the matter. As in the case of many another development in the history of culture, this one has been characterized by great enthusiasm, overweening confidence, and a somewhat uncritical evaluation of results. Gradually, however, we see ebullient assurance giving way to a more cautious spirit of inquiry, the glittering but unsubstantial froth of superficial investigation disappearing, and a solid precipitate of valuable information settling in the magazines of science.

The Formulation of Tests.—Probably the reader has already found himself inquiring "Just what constitutes a mental test? How are these alleged units of measurement derived? Are they really reliable—scientifically established and practically trustworthy?" The answer to these questions, it must be acknowledged, is not easy or wholly satisfactory. The science and art of mental measure-

ment, as we shall see, are considerably shot through with uncertainty. Postponing criticism, however, let us observe the methods actually in use.

The problem of formulating a test has two distinguishable aspects, namely the general character of the test and the particular norms or standards of success in performing it. With regard to the first point we should note that a *mental test is a typical mental operation.* It may be simple and elementary or highly complex; but in any case it is obtained by observation and analysis of conscious behavior. However odd or meaningless it may appear it always purports to exhibit some characteristic function of the mind. As a matter of fact the tests in ordinary use have been constructed by professional psychologists who were presumably most familiar with the workings of the mind. Such tests, first formulated in a tentative way, are applied to a large number of persons and on this basis are perfected in form.

But this is not all. Intelligence tests aim to discover something more, of course, than whether the subject can or can not do them. They are supposed to show whether he conforms to a special *norm* or *standard of intelligence.* What is this norm or standard? What, for example, is the normal intelligence of ten years of age? What tests indicate ability to do college work? What are the proper mental qualifications for clerks or machinists? What degree of efficiency in performing substitution tests points toward skill in telegraphy? Here again we may subdivide the problem. Norms of general intelligence are obtained by examining large numbers

of individuals and discovering to what extent they agree and differ in their performance. The results of such examination, when compiled according to statistical principles, show precisely the various degrees of efficiency which regularly characterize the operation of intelligence, and consequently what may be expected of a majority in a large group. Thus the nature of the mind, when scrutinized carefully, itself reveals what is normal. On the other hand standards for particular purposes such as vocational selection depend more or less upon the arbitrary opinion of those who have given the most study to the subject. A consensus of experts decides with some approach to certainty what degrees of excellence are requisite for special purposes. In any case, it should be noted, *the proper formulation of a test implies that it agrees with some other actual or ideal standard which is assumed to be true.* This standard may be nature's own average or majority, or it may be some form of authoritative opinion. The test, representing the standard, is simply a convenient means of discovering in an individual what would otherwise not be easily ascertained.

To put the matter concretely, entrance qualification tests for college are formulated by persons who have special acquaintance with the aims and methods of college work. Similarly the "good memory" needed by the salesman, or the accuracy of discrimination and quickness of reaction requisite for typesetting, may be determined by those whose opinion decides what constitutes skill or success in these occupations. But apart from such special purposes,

memory, discrimination, and reaction time, as the student of psychology knows, are traits in which individuals not only differ, but differ in relation to so-called "averages." To ascertain such averages or other quantitative standards with statistical exactness is a large part of the task of mental measurement.

Mental Age and Intelligence Quotient.—Perhaps no feature of mental measurement has played so large a part as the concept of *mental age.* As the term itself suggests, this signifies the degree of intelligence which normally accompanies a particular number of years of growth. It is defined by asking such typical questions or setting such typical tasks as a child of that age would normally meet in experience. This was the method followed by Binet and his successors, to whose extraordinary ingenuity and patience in examining large numbers of children we owe the scales now in universal use. The correspondence of a test with a particular age was determined by placing it at the point where seventy-five per cent of those tested performed it successfully and twenty-five per cent failed. This was on the assumption that half the whole group may be regarded as normal, a quarter supernormal, and a quarter subnormal. Though this division is obviously arbitrary it nevertheless serves effectually in practice to discriminate between different age levels. Beyond the age of fourteen or fifteen it becomes practically impossible to equate particular tests to successive years of growth, since by this time the fundamental functions of intelligence have

developed, and further advance consists of acquiring new kinds of information and new complex forms of operation which are so different in character and depend so much upon the special environment of the individual that representative tests can hardly be found.

Given a series of tests, or rather of sets of tests, for successive years, the mental age of an individual is ascertained by discovering how far along in the series he can successfully answer the questions. It rarely happens, of course, that the subject succeeds in all the tests of one set but fails in all those of the next. Usually his successes and accompanying failures are distributed over a range of two or three years, hence the equating of particular tests to a number of months or other points facilitates the reduction of his whole performance to a number which is taken as his mental age. In a typical subnormal case mentioned by Starch, for example, a boy approximately fifteen years of age was tested by the Terman Revision. He passed all the tests for three years, but failed in one of those for four, in two for five, in four for six, and in all for seven. Since he passed twelve tests beyond the age of three, twenty-four months, or two years, was added to the latter, making five years as his mental age.

The important question about an individual child, however, is usually not simply his mental age, but rather how this is related to his age in years. This relation, termed his *intelligence quotient* and commonly designated as his "IQ," is obtained by dividing the mental by the chronological age. Thus if

an eight-year-old child has a mental age of eight his intelligence quotient is one, or 100 per cent. If his mental age is ten, his IQ is $\frac{10}{8}$ or, omitting the decimal point, 125; if only six, his IQ is 75. The intelligence quotient of a child therefore indicates his degree of superiority or inferiority to the average in capacity and attainment. It is supposed by many students of the subject to remain approximately constant as the child grows older, though there is some difference of opinion on this point. Since there are no satisfactory year-tests beyond the age of fourteen or fifteen the term does not have precise significance for older persons. Up to this age, however, it is a convenient and fairly reliable measure of an individual's intelligence.

The distribution of intelligence quotients among children is given in the following table:—

IQ below 70	1%
IQ 70-79	5%
IQ 80-89	14%
IQ 90-99	30%
IQ 100-109	30%
IQ 110-119	14%
IQ 120-129	5%
IQ over 129	1%

The highest intelligence quotient which has been reported is about 190. An IQ of 140 or more is regarded as indicative of intellectual, though of course not necessarily of artistic genius. From this point downward we have successive degrees of superior, average, and inferior intelligence, until we come to 70, which is taken as the limit of "definite feeble-mindedness." Those having intelligence quo-

tients lying between 50 and 70 are called "morons"; those from 20 or 25 to 50 may be termed "imbeciles"; and those below 20 or 25 "idiots." The mental age of an adult idiot does not extend beyond the normal capacity of two years, that of the imbecile ranges up to about eight and the moron to twelve.

Mental age and intelligence quotient are computed by means of the Binet tests. In most cases these serve fairly well; in fact the IQ concept is generally regarded as a beacon light for the scientific advance of education. Theoretically it would be possible to ascertain it still more reliably by using a large number of specific tests of mental functions—scope of attention, perception of meanings, special forms of association, memory of different kinds of material, and more or less complicated logical inferences. Such tests would include both speech and other forms of intelligent reaction. By thorough investigation we might determine in all these respects age norms for successive years of development, which norms we could then use as measuring scales of considerable accuracy. As yet, however, only a beginning has been made in this direction.

In concluding this section a special word of caution is perhaps requisite. The compactness and apparent simplicity of the Binet tests offer a tempting invitation to amateur investigators to apply them to children with whom they are more or less closely associated. Those who are most versed in the matter agree that such a practice is to be deprecated.

They insist that the art of giving the tests in such a way as to win the child's confidence and get him to do his best, and at the same time not to give him undue assistance, requires both psychological knowledge and special training. The scoring of the tests also is a more technical process than appears at first sight. Unless the whole procedure is carefully regulated the result is worthless.

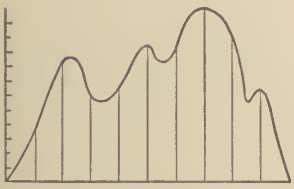
Statistical Methods.—(a) *Curves of distribution.* In the work of mental measurement much use is made of certain principles and methods which are borrowed from statistical science. One of these is the familiar concept of "distribution," which applies both to physical and to mental traits. When a large number of persons are measured in any respect, as for example in height, the results of such measurement show as we would expect that a few are very tall, a few very short, and the rest somewhat uniformly ranged in between. This distribution may be represented graphically by a curve which is the more regular and symmetrical the larger the number of individuals measured. The smaller the number, the more the curve is likely to be "skewed" to the right or left, or irregular in form. Thus we have as typical curves of distribution the following, in which the different degrees of the measurement are represented horizontally and the number of individuals of any particular degree by the length of the perpendicular at that point.

If we divide the base line of the curve of normal frequency into three equal parts and erect perpendiculars at the points of division, the middle sec-

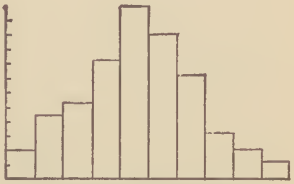
tion thus enclosed contains approximately two-thirds and the end sections each one-sixth of the total area. Taking this middle section as defining the range of greatest frequency—those more common differences which we sometimes call "average,"

Curve of normal frequency

Skewed curve



Multimodal curve



Rectangles representing groups of grades

using the term in a broad sense—then there are four times as many such individuals as either superior or inferior ones.

It is an especially interesting and important fact that human intelligence conforms to this principle. The larger the number of persons and the more accurate the examination, the more closely do the

results approach the curve of normal frequency. So it is with the distribution of intelligence quotients according to the Binet scale, as given on page 108. Similarly the application of the Army tests to college freshmen shows a fairly symmetrical curve of distribution. Applied to the draft as a whole, however, the tests brought to light a preponderance of low grade intelligence, and corresponding skewing of the curve. Since the principle of normal distribution, though fundamentally an assumption, is so well verified by experiment and statistical examination as to be hardly questionable, this skewing suggests that the tests or the conditions under which they were given were excessively difficult for the group as a whole. In general a skewed curve indicates either that the group was "selected," or that the tests were in some respects inappropriate.

The principle of normal frequency may be used as a basis for the assignment of grades in school and college work. The higher and lower grades, that is to say, may be given to a definitely small percentage of the class or other group, and the intermediate ones to a larger percentage. With respect to the curve this would mean that if the base line were divided into a number of equal sections corresponding to the number of different grades, and perpendiculars were erected at the points of division, the percentages of the group receiving the various grades would be the same as the part surfaces thus enclosed. Where the total number of individuals receiving grades is large, and the principle is followed not rigidly but somewhat elastically as a gen-

eral guide against the common tendency to give too many high grades, this method is probably as fair as any which can be devised. Many institutions have formally adopted such schemes of grading, in some cases exactly according to statistical principles, in others rather loosely and with more or less allowance for the eccentricities of the persons who assign the grades. In one large university, for example, instructors are requested to distribute their passing grades as nearly as possible according to the following proportions: 15% A's, 35% B's, 35% C's, 15% D's. Many instructors find that the more carefully they assign their grades the more closely they approximate the principle of normal frequency.

(b) *Mean, median, and mode.* In the work of mental measurement we frequently want to know where a particular individual stands with reference to others in his group, whether high or low or somewhere near the middle. Occasionally, too, it is desirable to compare the mentality of one group, e.g., the seventh grade performance in arithmetic in a particular school, with that of another. In order to facilitate such comparisons it is useful to ascertain certain so-called "central tendencies" of the group, namely, the mean, the median, and the mode.

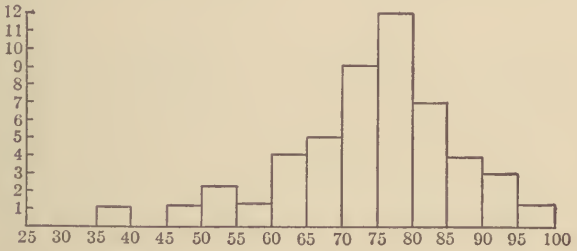
The *mean* or *average* is obtained by dividing the total score of the whole group by the number of individuals composing it. The resulting score, of course, may not be identical with any actual score in the group. For large groups this process of calculation is somewhat laborious, and the result may

be unsatisfactory if there are a few exceptionally high or low scores which so raise or lower the mean as to give a wrong impression of the general character of the group. Hence a more significant basis of comparison is found in the *median,* which is the particular score that divides the group into two equal parts, i.e., so that there are as many higher scores as lower. This is obtained by arranging the scores in order of increasing size and counting from one end to the middle point. If the total number of scores is odd, it is the $\frac{n+1}{2}$ score. If the total number is even, it is the $\frac{n}{2}$ score, or if greater accuracy is needed, the imaginary score halfway between this and the next one. When the middle point falls within a group of several scores which are the same, this score may be taken as the median, or for further accuracy it may be corrected by a process of calculation which need not concern us here. As the median or "50 percentile score" divides the group at its middle point, so the 25 percentile and 75 percentile scores indicate its further subdivision into "quartiles." These divisions, e.g., the upper quartile, are especially convenient for certain statistical purposes. Finally, if a particular score appears many times this fact may itself be significant as indicating common traits of intelligence, or may otherwise prove useful. The *mode* is that score which occurs most frequently in the whole group. A group or corresponding curve which has several such predominating scores is called "multimodal."

To illustrate these technicalities let us consider the following typical group of scores:

79	63	82	91	82	76	72	73	62	77
65	78	78	62	70	78	79	46	86	75
51	80	95	75	82	66	78	82	71	86
82	74	80	73	67	88	57	84	69	82
98	87	67	37	92	76	72	53	79	73

Rearranging them in order, and representing by rectangles of equal width and different height those which fall in successive ranges of five points each, e.g., 61-65, 66-70, we have the following graph:—



The mean or average of the group is 74.6. Since the middle point lies between the 25th and 26th score the median is 76.5. The mode is 82.

(c) *Correlation.* Another statistical concept which has been found very useful in the measurement of intelligence is that of *correlation.* This is *the degree of agreement between two sets of scores.* It gives a precise answer to the question, How does the performance of individuals in one field compare with their performance in another? What, for example, is the relation between proficiency in Latin and proficiency in English? Or between mathematics and the study of law? Do the scores made

in intelligence tests agree with the grades given by teachers in school and college? How does excellence in study correlate with success in life? Almost everyone has his own answers to such questions, answers which for the most part express sheer prejudice, or the uncritical acceptance of someone else's opinion, or at best a general impression derived from a very limited observation of a few special cases.

A scientific answer is obtained by a mathematical formulation of scores. There are several such formulas. The one in common use, known as "Pearson's coefficient of correlation, is $1-\frac{6 \text{ sum } d^2}{n(n^2-1)}$ in which n is the number of individuals tested, and d is the difference in the rank of the same individual in the two sets of scores. The limiting values of the formula are +1 and —1. A correlation of +1 means that the first individual in one test was first in the other also, the second in one was second in the other, and so on. A correlation of —1 would signify that the individual having the highest score in the first test had the lowest in the second; that number two in one was next to the lowest in the other, and so on. "Zero correlation" means that the individuals in any part of one series of scores are scattered indefinitely over the whole range of the other series. The limiting cases, of course, practically never occur. What does frequently happen in the kind of case to which such calculation is applied is a positive correlation of 50 or more, which not only shows a general agreement between the two sets of scores, but also signifies some underlying

reason for this agreement, such as native ability or similarity between the tests in subject matter.

As an illustrative case of correlation let us observe the following: A certain "battery" of group tests of general intelligence given to a class in elementary psychology resulted in scores ranging from 15 to 196. The grades received in the course, reduced to a percentage basis, ranged from 25 to about 90. Omitting the actual scores and percentages for the sake of brevity, and arranging the individuals in order, we have:

Individuals	*Rank in Test*	*Rank in Class*	d^2	*Individuals*	*Rank in Test*	*Rank in Class*	d^2
A	1	5	16	P	16	18	4
B	2	1	1	Q	17	8	81
C	3	7	16	R	18	15	9
D	4	4	0	S	19	27	64
E	5	3	4	T	20	17	9
F	6	6	0	U	21	20	1
G	7	16	81	V	22	19	9
H	8	11	9	W	23	28	25
I	9	14	25	X	24	22	4
J	10	9	1	Y	25	24	1
K	11	26	225	Z	26	21	25
L	12	2	100	AA	27	23	16
M	13	12	1	BB	28	25	9
N	14	10	16	CC	29	29	0
O	15	13	4	DD	30	30	0

Accordingly the evaluation of the formula gives us $1-\frac{6\times 756}{30\times 899}=.83$. In other words, there is a high correlation or close correspondence between the test scores and the grades given by instructors in the course, this in spite of the fact that in five cases, G, K, L, Q, and S, the rank in class and in test dif-

fered conspicuously, and that in two cases, K and L, individuals whose test scores were near the middle of the group were graded respectively among the best and among the worst in the class. Since the test scores do not depend upon the instructor's opinion, this high correlation is significant of the reliability of the latter. The exceptional cases need further analysis.

Practical Applications.—The principal uses of intelligence tests lie in the field of education. Here their general function is that of classifying pupils more exactly than is otherwise possible, in order that each individual may receive appropriate instruction. Leading educators are in agreement with regard to the importance of discriminating precisely between different levels of intellectual capacity, and of adjusting school environment and training to these levels.

Let us observe some specifications of this function. In the first place the scientific measurement of intelligence bears directly upon the problem of "retardation." According to Terman, "Statistics collected in hundreds of cities in the United States show that between a third and a half of the school children fail to progress through the grades at the expected rate." [1] The retardation in many cases amounts to two, three, or even more years, and involves large expense in reteaching, frequently without success, what the children have already failed to learn. To a great extent this failure is due to natural disability, and its effect upon the mind of the

[1] *The Measurement of Intelligence*, p. 1.

pupil is exceedingly bad, since the consequent discouragement tends to kill all desire to study, and to turn the attention to objectionable pursuits. In such cases an exact mental examination is needed in order to determine the degree of incompetency and to insure the placing of the child under appropriate conditions of instruction. Where the deficiency is so great as to be termed "feeble-mindedness"—which includes about one per cent of enrolled school children—it is especially desirable to discover the fact as soon as possible, and thereby to prevent not only failure in school but also in some measure later industrial inefficiency, pauperism, and crime.

Equally important is the discovery of superior children. Some of these never have their capabilities recognized, and in consequence never receive adequate school opportunities. Many acquire bad habits of "submaximum efficiency," working just hard enough to keep pace with their less gifted associates, and turning to mischief in their spare time. Their very precocity may invite social dislike from their fellows, and perhaps even unwise discouragement from their teachers, with the result that they become permanently disinclined to do their best. In view of the fact that the advance of civilization depends in large measure upon the contributions of the specially gifted, that the latter blaze the way in the various fields of culture, literature, science, politics, art, and religion, we see the need of ascertaining and developing for the sake of society the extraordinary capacities which character-

ize a few individuals. "Every argument," says Colvin, "that applies to the special treatment of the subnormal classes, applies with far greater force to special opportunities for those possessing superior talent or genius." [1]

Furthermore, intelligence tests can be used to supplement examinations of the usual form as a method of ascertaining fitness to advance. If it is important to discover what the pupil has learned, it is at least equally important to determine his capacity for further learning. The vital question in education, in fact, is not what he has done, but whether he can do the work which faces him. A series of tests expressly designed to demonstrate intellectual powers of various kinds would be as reliable in this respect as the customary reports of teachers based on class room performance. It is probable that standardized tests in school subjects, tests which reveal ability to make further progress, will eventually replace the traditional kind of examination. Colleges are finding intelligence tests useful as correctives of untrustworthy certificates of secondary school preparation.

Closely related to these applications is that of vocational direction. Here again we are obliged to acknowledge that the usual methods are unsatisfactory. Choice of work, when it is not dictated by necessity, is often due merely to casual opportunity or to imitative impulse. Actual trial serves to show whether the individual is or is not fitted for the occupation. This process involves in many cases waste

[1] *The Learning Process*, p. 19.

of time and the discouragement of failure on the part of the worker, not to mention economic loss to the employer. Hence in so far as fitness can be determined in advance of actual trial, such expediting of the process is greatly to be desired. This may be accomplished to some extent by analyzing occupations into their essential elements, psychologically considered, and testing the candidate's corresponding mental qualifications. In other cases it is possible to correlate occupational efficiency with "general intelligence," so that a high or low intelligence quotient becomes vocationally significant. The information thus obtained may serve specifically to direct an individual into work for which he is naturally adapted, or perhaps more often to eliminate those who would inevitably fail. This possible extension of applied psychology we shall discuss at greater length in a later chapter.

The work of mental measurement also relates itself helpfully to moral delinquency. With regard to intelligence tests in this field Terman remarks, "One of the most important facts brought to light by their use is the frequent association of delinquency and mental deficiency. . . . Such tests have demonstrated, beyond any possibility of doubt, that the most important trait of at least 25 per cent of our criminals is mental weakness." [1] There is an apparent reason for this fact. Morality and obedience to law are due to various factors in human nature, not the least of which is the ability to foresee the consequences of acts. Many crimes and misdemeanors

[1] *The Measurement of Intelligence*, p. 7.

are explained in part by the failure of the offender to discern the probable or inevitable outcome of the deed. Likewise the intellectual inability to grasp a moral principle—which of course is only a summed up statement of a wide range of actual and possible facts—signifies a lack of needed inhibitions at a critical moment of temptation. The impulse to steal, for example, is inhibited by an intelligent anticipation of detection and punishment, the distress of others, the ultimate uselessness of the act, the bad effect on one's character, and so on, as well as by a more abstract apprehension of the force of the commandment "Thou shalt not." Lacking such vision the mental defective slips the more easily into wrong doing. Accordingly the courts are making increasing use of intelligence tests in order to determine more justly whether bad conduct is due to stupidity rather than to malice. The discovery of potential criminals, especially among juvenile first offenders, leads naturally in some instances to their segregation in institutions where they may be properly educated, thus safe-guarding both themselves and society.[1]

The precise methods of psychological examination are occasionally useful also in the diagnosis of mental disorder. Not only does the general abnormal or pathological character of the case sometimes reveal itself through inability to perform the tests; in some instances the peculiar nature of the responses

[1] The connection of mental deficiency with moral delinquency has been exaggerated. Statistics collected in penal institutions show, perhaps, not so much that the mentally deficient are especially apt to commit crimes and misdemeanors, as that when they do so they are less able to escape detection. Nevertheless it remains true that deficient intelligence occasionally implies lack of inhibitions, and thus leads to wrongdoing.

points unerringly toward the cause of the malady. This is especially true of association tests. Since the course of association is determined in part by emotional interests, including memories and desires such as sometimes lie below the threshold of consciousness, skilfully directed suggestions to the patient bring responses in the form of associated words and actions which indicate the hidden sources of the disease. A word or phrase itself, or the haste or delay in uttering it, or a mere shudder or flush, may serve to reveal the origin of a psychasthenic fear or the presence of a covert impulse of dangerous sort. The mental maladies resulting from the war, especially the various disturbances which we have ignorantly termed "shell shock," are being studied by means of psychological tests.

Association tests have also been proposed as a means of ascertaining the guilt or innocence of a person accused of a crime. Theoretically, of course, the criminal's peculiar knowledge of the facts ought to express itself in his associations with certain "key words," since either his response words themselves would be significant, or his delay in producing them would indicate an effort to conceal something. This is easily demonstrable as a laboratory experiment with pseudo-criminals, but the method naturally presents greater difficulties in relation to the obscurities of genuine crime. Theoretically, too, the psychologist should be able to detect falsehood on the part of a witness by measuring exactly the physical reactions, especially perhaps the blood pressure, which accompany the utterance. Presumably these

reactions differ in some definite respect from those which accompany truth telling. Whether such methods can be made scientifically reliable remains to be seen.

A function of intelligence tests which perhaps is destined to become as useful as any is that of verifying hypotheses. In all the various fields of applied psychology, especially that of education, there are controversial theories which as yet lack confirmation by fact. Such questions as the relative importance of heredity and environment in learning, the differences of mentality between races and between the sexes, the extent to which training in one field is carried over to another kind of subject matter, the motives and conditions of efficiency in industry, the effectiveness of various forms of advertising—these and similar problems call for solution in terms of demonstrable facts, such facts as can be demonstrated only by the methods of mental measurement.

Criticisms.—The purpose of mental measurement is certainly scientific. The movement aims to analyze the phenomena of intelligence, or to formulate its typical operations, to measure these individually and collectively, and to exhibit their correlation with the actual work of life. Ordinary behavior is assumed to consist of complexes of such functions, just as familiar things are assumed to be compounded of physical or chemical elements, or as their behavior is like the typical processes which science studies in the laboratory. Speaking generally and making due allowance for the co-

operative effects of emotional and volitional character, it is supposed that the individual who succeeds or fails in the tests will correspondingly experience success or failure in the affairs of actual life in so far as these involve the functions tested. Hence the investigator strives to reveal the precise nature of the mind, to formulate its laws of cause and effect, and so to tell what may be expected in the future. From this point of view the effort simply displays the descriptive, explanatory, and prognostic functions of science in general.

Whether it succeeds in doing this, or indeed whether the aim is possible of realization, is a further question. The idea of mental measurement has been subjected to severe criticism, much of which is so uninformed and irrelevant as to be unworthy of notice, but which in part deserves consideration because it comes from experienced psychologists. This criticism is aimed especially at the concept of general intelligence and the methods of testing it. The principal points are the following:

The fundamental contention is that intelligence is too complex and multiform a function to be measured by such units as have been devised. It cannot be reduced to a few typical operations. It is so essentially related to its subject matter, which is infinitely various in form, and it varies so widely in its modes of expression, that no set of tests can be regarded as comprehensive or accurate. Hence in actual operation it is always likely to surpass or to fall short of what the tests indicate as its character.

This criticism has several specifications. In the

first place the fact that there may be special abilities of which the tests take no account renders them unreliable as a guide. Persons of low grade mentality occasionally astonish us by displaying extraordinary capacity of some particular and perhaps novel kind. To mention a humble illustration, a man in one of the army camps who was pronounced hopelessly unintelligent by examiners proved to possess a remarkable faculty—was it not intelligence of a sort? —for handling mules! Counterwise, some individuals who have high intelligence quotients show striking deficiencies in certain respects. Secondly, the exercise of intelligence involves subtle factors of emotional and volitional attitude which vary greatly within the experience of an individual. Performance may depend not only upon conditions of a fatigue or fright, which may be avoided, but also upon influences of liking or disliking, ambition or carelessness, confidence or discouragement, which are too intangible to regulate. Interest, personal relation to the tester, the stimulation or repression exerted by a surrounding group, these are some of the circumstances which may vitally affect the results. Third, the tests make use of language, both in formulation and in performance, in a way which does injustice to individuals who do not possess linguistic facility. Persons differ greatly in their ability to understand and use words. Many situations in actual life which call for intelligent action do not involve speech at all. Language tends to befog some minds, while in others it conceals real deficiencies of intelligence. Lastly, the tests do not reveal possibilities of devel-

opment. What we need to know in many instances is not merely the individual's present capacity, which may be small, but how much this may be expected to increase. Growth depends to some extent upon factors which lie beyond the range of the tests. Certain critics believe that there is grave danger of frustrating the life of a child on the basis of his performance at a particular time.

From a practical point of view it is said that the outcome of the whole effort is unsatisfactory. Interminable investigations, tests and correlations of tests, innumerable books and magazine articles,—what does it all amount to? The actual work of society remains for the most part quite unaffected, not only because of economic obstacles to change, but also because of lack of assurance as to just what changes are needed. In so far as the measurement merely corroborates what we already know, the labor is superfluous; in so far as it produces results which are at variance with other judgment, we do not have sufficient confidence in these results to make them the basis of innovation.

In reply to these criticisms the advocate of mental measurement might say that they do not disprove the existence of general intelligence, or necessarily depreciate the value of mental tests. General intelligence signifies what usually though perhaps not invariably happens. Special abilities may coexist with it, but it nevertheless remains the individual's general intellectual character. Its operation undoubtedly depends upon all sorts of conditions, yet these do not ordinarily raise or lower its level in any

marked degree. So, too, while language is not a perfectly trustworthy mode of expression it runs parallel, on the whole, with intellectual power. As for the possibility of development, since it can take place only on the basis of what actually exists, these traits, if correctly ascertained, afford our surest prognostication. In short the level of intelligence in any individual is approximately constant, or in other words he has enough intellectual uniformity to constitute a proper subject of investigation. Continuous refinement of method, both to measure general intelligence more accurately and to take account of discrepant special abilities, is included in the purpose and plan of the movement. At present the energy of investigation outruns practical results, but this is characteristic of many scientific advances, and in the long run it makes for efficiency. Specific reforms—which, by the way, are not the primary concern of the investigator—will come in due time.

Whatever the relative merits of these criticisms and rejoinders, mental measurement must be regarded as a permanent addition to applied psychology. Its results, though admittedly imperfect, have corroborative value, and to some extent give reliable guidance for action. For certain purposes the method is probably better than any other which has been devised.

QUESTIONS AND EXERCISES

1. What is the general definition of intelligence? Name several processes of intelligence. What ones are fundamental?

2. What are the principal types of intelligence as related to different kinds of subject matter? How do persons differ in this respect?

3. State precisely what is meant in psychology by "individual differences." How is their existence explained?

4. State the aim and describe the general character of the Binet intelligence tests.

5. Mention some other systems of intelligence tests. Give illustrations of particular tests.

6. Describe in detail the character of association tests, and distinguish between different forms.

7. Give distinctive illustrations of (a) individual and group tests, (b) language and performance tests, (c) general and special intelligence tests.

8. How are standards of intelligence determined in formulating tests?

9. What is the meaning of the terms "mental age" and "intelligence quotient"? At what age, normally, have all the fundamental functions of intelligence been developed?

10. What are the different degrees of subnormal intelligence, and how are they defined in terms of mental age and intelligence quotient?

11. What is the "curve of normal distribution"? Mention an illustration of it in the field of mental measurement. What is a "skewed" curve?

12. What are the "mean," the "median," and the "mode" of a group of scores? What are the upper and lower "quartiles"?

13. What is the meaning of the term "correlation" as applied to two groups of scores? Explain the meaning of the statement that "there is a high correlation between the results of intelligence tests and proficiency in school work." What is "negative correlation"?

14. What are the principal uses of intelligence tests in the field of education?

15. Show how intelligence tests may be of service in relation to industry, medicine, and criminology.

16. Explain the assertion that "mental tests are useful for verifying hypotheses." What is meant by their "corroborative value"?

17. In what respects are these methods of measuring intelligence genuinely scientific?

18. What are the principal criticisms of them? What replies may be made to these criticisms?

19. Draw the distribution curves of the following groups of scores:

(a)	35	45	30	25	65			
	55	35	25	40	20			
	40	55	25	60	45			
	25	50	35	40	30			
(b)	13	14	10	19	11	14	12	15
	15	8	17	12	16	19	14	13
	12	13	12	14	13	11	13	9
	20	13	14	12	15	13	11	18
	14	18	11	10	13	12	9	14

20. Find the mean, median, and mode of each of the groups in Ex. 19.

21. Make a graph of the following group of scores, using rectangles to represent ranges of twenty-five points. Find the mean and median.

154	130	87	156	166	92
167	157	134	132	169	185
130	196	168	144	72	36
132	141	15	131	141	142
166	148	71	154	122	123

22. Find the value of the coefficient of correlation in the following case:

Individuals	Rank in 1st test	Rank in 2nd test	Individuals	Rank in 1st test	Rank in 2nd test
A	3	5	F	2	3
B	1	4	G	8	6
C	7	9	H	9	8
D	4	1	I	6	3
E	5	2	J	10	7

23. Rank the individuals in the following group according to grades, find the coefficient of correlation, and compare its significance with that of Ex. 22.

Individuals	Grade in 1st test	Grade in 2nd test	Individuals	Grade in 1st test	Grade in 2nd test
A	98	95	F	90	94
B	96	97	G	87	82
C	95	92	H	85	80
D	93	88	I	92	85
E	90	89	J	80	81

24. The effectiveness of the association method is easily demonstrated. Read the following passage carefully, taking pains to visualize its details. Then read the appended list of words and note the first word which comes to mind in response to each one in the list. Check the cue words which have the "warm" feeling of relation to the subject described. It will be observed that significant associations are uncontrollable, or that if an attempt is made to withhold them the association time is prolonged.

"The money, amounting to about three hundred dollars, all in new bills, was in a small box lacquered in red on the outside and bearing on its top a Chinese inscription in yellow characters. The box was in a bureau drawer. The thief, who entered from a fire escape, pried the cover open, breaking the lock. In his hasty exit he left a small chisel. An opal scarfpin in a gold setting was also taken."

cold	ask	foolish	luck	red
book	mountain	money	wild	sad
room	Chinese	head	take	fire-escape
enter	old	lock	custom	paint
pay	beat	angry	late	polish
writing	steal	water	chisel	pin
friend	blue	opal	bread	grass
box	candy	anxiety	rich	street

PART TWO

EDUCATION AND EVERYDAY LIFE

CHAPTER VI

FUNDAMENTAL FACTORS IN EDUCATION

The Psychology of Education.—The first department of applied psychologly to be systematically developed was that of education. Investigations in this field took several directions, beginning with an analytic study of the intellectual functions used in learning, advancing therefrom along a pathway of experimentation toward a scientific determination of the general principles of education and the solution of certain controversial problems, and coming at length to the elaborate work of measuring individual differences of intelligence. The last of these developments straightway became a method of wide application, embracing not only various questions about education itself, but also related ones in medicine, industry, and other fields. In this book the order of divisions of the subject is reversed. Mental measurement, because of its far-reaching significance for applied psychology, was included in our statement of fundamental principles and methods. The others we have now to consider. We want to know what psychologly has to say about certain problems of education, problems concerning the broad, underlying principles and also the particular methods of study which conduce to intellectual effi-

ciency. Much of the work of experimental education, as for example, the investigation of particular branches of the school curriculum, has become so technical as to lie outside the scope of this presentation of the subject. On the other hand, since a great deal of our education in everyday life is of an unsystematic sort primarily involving the emotions and the will, we shall observe some psychological principles and practical rules which aim at the regulation of these functions of human nature.

Education has certain broadly characteristic features, some of which are matters of common knowledge, verified by general observation, while others are topics of controversy. In the former category we may place the dependence of learning upon appropriate mental or physical activity, its combination of random, imitative, and analytic methods of procedure, and the natural variations in its rate and progress. These have also been ascertained with precision by psychological experiment. Much less clear are the questions of "transfer of training," the relative influence of heredity and environment in learning, and the mental differences of races and of the sexes. Many of these subjects of discussion are characterized by sharp differences of opinion, which, it must be acknowledged, consists largely of uncritical assumption and hasty inference, sometimes strongly reënforced by emotional prejudice and inaccurate observation. Into such discussions psychology has come with its use of scientific method, its statistical researches and laboratory technique, seeking to discover the truth. Even where there is

no controversy it offers interesting verification, and a large amount of exact and illuminating detail which tends to improve methods of teaching.

Not that a knowledge of educational psychology necessarily makes a good teacher, any more than the technical study of the theory and practice of music makes a good musician. Actual teaching like musical art has deeper roots than scientific information. Yet in teaching as in music an intellectual grasp of the processes involved facilitates perfection in some degree, provided there is a basis of natural ability. The facts and principles serve to guide one's performance, to clarify aims and lessen blunders. They are useless apart from native insight into the mind and native power of instruction, but given these traits they become helpful. It is a general truth of educational psychology, as we shall presently see, that learning is most useful to the most gifted. And the same truth applies to the student as well as to the teacher. Rules for efficiency are valuable just in proportion to one's intelligence in grasping and applying them. So also with regard to the regulation of emotion and will in daily life. Psychology has much to say that is useful to those whose disposition and acumen qualify them to take advantage of it.

One group of educational problems which present themselves for consideration has reference to the fundamental factors of heredity and environment. As we have just indicated, education is a joint product of these two forces; in one sense it is imposed from without, while at the same time it is no less

genuinely an unfolding from within. On the one hand we have "original nature," the racial, sexual and family inheritance of the individual, physiologically established in the organism and developing according to its own inner laws; on the other, the infinite variety of influences exercised by our natural and social surroundings, the laws of the physical universe and the behavior of man. These inner and outer factors constantly coöperate to make us what we are. Neither is independent of the other, but their precise relations and relative importance are not clearly determined. In this chapter we shall consider two or three questions of this sort, partly to emphasize their educational significance, and partly to show the function of applied psychology in this field.

Heredity and Environment.—We pass accordingly to the problem of the relative importance of heredity and environment in the achievement of the individual. Which is the more powerful factor? Is native ability the principal determinant of character and performance, so that we inevitably become what we are born, and attain at best only that degree of distinction for which nature has fitted us from the outset? Or may environmental forces, especially those of formal and informal education, affect our careers predominantly, leading or driving us up to levels which we would not otherwise reach, whatever our native endowment? Related to this question are others having reference to the mental differences of the sexes, and of the various races of mankind. Does white differ essentially from black

in point of mentality, European from Oriental, Frenchman from German, and so on? Are the undeniable differences between the mental processes of men and those of women the product of education and social environment, or of something far deeper, something inborn? Evidently these questions have far-reaching implications for educational practice.

The problem was first attacked by statistical methods. The researches of Galton and others seemed to show that ability runs in families, producing the world's great for the most part in hereditary strains, while at the opposite end of the scale the world's worthless outcasts come with similarly remarkable uniformity from particular lines of ancestry. The more distinguished royalty and nobility belong to certain stocks. Original capacity, not the accident of birth, has made them great. Some families contain an astonishing proportion of criminals and defectives. The typical case of a family history studied by Goddard, the famous "Kallikaks," is especially instructive because of the startling contrast between its two main branches. The first of these was the product of an illegitimate union of a mentally normal man and a feeble-minded girl. The four hundred and eighty direct descendants "included 143 feeble-minded, 292 unknown, 36 illegitimate, 33 prostitutes, 24 alcoholics, 3 epileptics, 82 died in infancy, 3 criminals, 8 keepers of disreputable houses, and only 46 normal individuals." Subsequently the father married a woman of normal intelligence. Of the 496 direct descendants all except

five were normal, and occupied positions of respect in society.

"One thing seems to stand out very conspicuously from the numerous facts of family histories which have been unravelled in recent years, namely that much defective mentality, degeneracy, and crime is a matter of ancestry. General opinion among persons in charge of institutions for defectives is that two-thirds of all cases are due to heredity and one-third to environmental or unknown causes." [1] On the other hand it is equally certain that intellectual and artistic distinction likewise come mainly from inherited sources. If hereditary endowment produces the dark depressions in the contour of humanity, it also tends with similar necessity to rear its elevated peaks of character and attainment. It should not be forgotten, however, that the statistical conclusions are only approximate generalizations, having numerous exceptions, and that heredity is usually complicated with environmental influences which work with rather than against it, and in some cases greatly accentuate its effects. But whether the individual is distinguished or undistinguished, normal or abnormal, the general significance of the statistical facts is that he owes his ability primarily and perhaps predominantly to his ancestry.

Another line of investigation has regard to the similarity of mental capacity of "siblings" or children in the same family as compared with unrelated children. This subject has the advantage of being somewhat accessible by the more exact methods of

[1] Starch, *Educational Psychology*, pp. 78, 79.

psychological measurement, since both school performances and psychophysical functions as tested in the laboratory afford numerical data. If heredity is the preponderant factor we should expect to find high correlations among pairs of brothers and sisters, and this is actually the case. Several studies made by Thorndike and others have shown coefficients ranging from .40 to .75, figures which become the more significant when we remember that the correlation of pairs of unrelated children taken at random would be zero, and that any positive correlation indicates a resemblance due to some cause, which in the case of siblings cannot be fully accounted for by environment. Especially in twins is the mental similarity conspicuous, and since it is not substantially greater in older than in younger twins it cannot be ascribed to education. There are of course innumerable instances of children in the same family, even twins, who differ widely; inheritance is unique, and varies from individual to individual in the same line of descendants. But this fact does not invalidate the general truth that persons of the same ancestry are more alike than other persons. The inherited differences themselves, instead of disappearing under the influence of common environment, remain approximately constant.

Even in this aspect of the matter, however, the complication of hereditary and environmental factors tends to obscure the relative parts played by each. Just what is inherited is undefined, as is also the precise bearing of the various environmental influences which operate within the family. Hence

we can only say that the results of investigation point somewhat vaguely toward the predominance of heredity in ability and achievement. A still more exact and reliable way of dealing with the problem is that of ascertaining how the same training affects individuals of different mental capacity. The method, in brief, is that of examining subjects to find their initial ability in some respect, then giving them a certain amount of training in this function, and finally reëxamining them to discover how much they have profited individually by the training. Here again the evidence seems to be significantly in favor of heredity. In one of Thorndike's experiments, for example, the upper third of a group given the same amount of practice in addition advanced on an average 140 points, the middle third 111, and the lower third only 54. Numerous other investigations have yielded similar results.

"All experimental results," says Starch, "point in the direction that practice does not equalize abilities; in fact, equal practice tends to increase differences in achievement and skill rather than to decrease them. The more gifted individuals profit more, both relatively and absolutely, than the less gifted. This experimental fact is one of the most profound bits of evidence regarding the whole problem of heredity and environment." [1]

Lastly we should mention the effort to discover whether the intelligence quotient, which is regarded as an index of the individual's general intelligence, varies from year to year. If so, it is a plausible in-

[1] Starch, *Educational Psychology*, p. 91.

ference that its variation is caused by environment. If on the contrary the intelligence quotient does not change, whatever the educational influences brought to bear on the individual, we should infer that general intelligence represents native ability in its natural development. The recency of this line of investigation prevents us from accepting any conclusion as final, but it is noteworthy that those who are most practised in mental measurement believe that the IQ remains approximately constant.

In short, many scientifically minded students of the problem hold that heredity is a more powerful factor of achievement than is environment. Just what are their relative degrees of importance is a further question to which perhaps no very definite or universal answer can be given. Possibly it varies in individual cases. Starch asserts that from sixty to ninety per cent of one's achievement is due to heredity. Since figures have only an illusory definiteness in so foggy a matter we shall remain on safer ground if we simply attribute a somewhat superior efficacy to inherited powers.[1]

Prizing as we naturally do the work of education in developing personality, any conclusion which thus seems to minimize its importance appears pessimistic, yet it is not really so. In the first place it does

[1] The writer, for reasons which are perhaps too abstract to be strictly psychological, is inclined to question the propriety of comparative valuation, or if comparative terms cannot be avoided, to say that heredity and environment are of equal significance. If education is sometimes ineffective, it is no less true that inherited powers suffer atrophy from the lack of it. Each depends indispensably upon the other. The apparent superiority of heredity is due to its primary character, and to the fact that we easily overlook the effectiveness of some forms of environmental influence because they are so common, or as impalpable as the air we breathe.

not regard education as superfluous, but says rather that the extent to which it aids in producing distinction depends upon native ability and the disposition to make use of it. In this sense it is the less weighty factor. Furthermore, since few persons attain the limit of efficiency which environment makes possible, or would if it were improved, we ought not to be greatly disturbed by the preponderance, if it be such, of what is inborn. The prevalent scientific doctrine implies not that it is less, but rather all the more desirable to provide the individual with education which will bring his native ability to its fullest realization. That this attainment has its natural limits, is a truth which it is mere common sense to acknowledge.

The practical implication of the principle is twofold. First, it is important to discover special aptitudes and to give them the education which they deserve, taking pains not to allow them to remain unrecognized or become perverted through lack of appropriate training. The gifted child needs to be placed in association with others like himself and given tasks which call forth his powers, instead of being kept in a situation where mediocrity is so prevalent that he is constantly tempted to do less than his best. Second, in so far as the individual lacks capacity by original endowment it is futile to try to produce it by education. Those who are naturally incapable of profiting by college training, for example, ought not to waste the energy, time, and money which it requires; hence it is desirable to ascertain this fact in advance if possible. There is a

danger here, however, to which we must not be blind. The attitude of "educational determinism," as it has been called, which denies opportunities to those held incapable of profiting by them, is likely to become harsh and indiscriminate. Capacities sometimes lie hidden. Small gifts escape all but the extraordinarily observant eye, and even its perception may have to be supplemented by a good deal of faith. Yet these abilities may be just as valuable to their possessor as the larger ones of the more fortunate. The astonishing extent to which the dull and clumsy improve under expert and systematic teaching constitutes a warning against hasty application of the principle of hereditary superiority.

Race and Sex.—The psychological study of racial differences is not yet sufficiently developed to permit conclusive statements about particular characteristics. There have been some noteworthy investigations, but inferences with regard to so vast a subject are likely to be unreliable because of the uncertainty whether the individuals and groups examined are typical. This is especially true in the case of immigrant groups. Special studies have usually been based on small numbers, and have sometimes been tinctured with prejudice. We may make a few general observations, however.

There is no evidence that any race, white, yellow, brown, or black, possesses any essentially different kind of mental process from those of other races; in other words the notion that the mind of anyone is ultimately inscrutable in any respect has no scientific standing. Intellectually, certain races appear

to have less power than others, that is to say their average is lower. The differences, however, are much less conspicuous in the elementary functions than in the more complex ones; and it is possible that the different achievements of civilization are mainly due to external conditions of natural environment and contact with other culture. The assertion that the mind of the black races has a fundamental inferiority, constituting a limit beyond which it cannot advance, is disputed. It manifests under existing conditions a general inferiority of intellectual interests and accomplishments, but to what extent if any this signifies essential and permanent disability we do not know. In any case the range of variation within the race is much greater than the difference between it and other races. In the general field of feelings and emotions one may note peculiar characteristics of behavior; but these, though perhaps primarily due to inherited nervous organization, are doubtless also the product of social environment, i.e., of conscious and unconscious imitation.

More definite conclusions hold with regard to the sexes. Psychologists have made many measurements of mental functions at different ages, with the result of demonstrating slightly different rates of development, preponderant resemblance, and some significant divergences. Their pronouncements have considerable certainty. "Summarizing," according to Starch, "we may say that women and girls are superior in sensibility, in memory, in most forms of perception, in quality of handwriting, and linguistic fluency. . . . Men and boys are superior in motor

capacities, such as tapping, quickness of reaction, in arithmetical reasoning, and in resistance to suggestion. . . . The two sexes seem to be approximately equal in associative processes and in most school subjects. The amounts of difference, however, are small." [1] Neither sex has any peculiar form of intelligence. Apparently there are differences in the use of abstract ideas and processes of inference; men seem to be more addicted to reasoning, women to quicker perceptual processes commonly called "intuition." But in these as in other respects the range of variation in each sex is large, in fact immensely greater than the average difference between the sexes. It may be questioned also whether the same mental function does not vary in relation to the kind of subject matter; that is to say, whether the individual does not show a more rational habit, for example, or a greater susceptibility to suggestion in dealing with some problems than with others.

With regard to feelings and emotions, sentiments and traits of moral character, there are more or less obvious differences between men and women. Such facts are not exactly measurable, but by averaging the judgments of intelligent persons about individuals an approximation to measurement is obtained. On the whole this tends to corroborate common opinion which holds that the sexes differ in certain respects. Women are supposed to be more docile, more sympathetic, more sensitive esthetically, more religious, more self-sacrificing and loyal to those they love; while men are more active, more independent

[1] *Educational Psychology*, pp. 68, 69.

and self-assertive, more adventurous, more acquisitive, and more constructive. In general the character of women is regarded as more emotional, that of men as more strongly volitional. All such generalizations are exceedingly rough, however; one never has to look far for exceptions. A broad and far-reaching distinction, according to Thorndike, is that women are characteristically interested in *persons,* men in *things.* Men invent, repair, and for the most part use machines. Women are fond of fiction and dramatic art, which portray human emotion.

These more or less obvious differences between men and women are due in part to physiological peculiarities of size and muscular power, as well as to special sex functions; but no less are they the product of education and social environment, which early fix certain forms of behavior in the child. Not only are boys and girls usually brought up differently in the home; their wider social relations likewise tend to give them different forms of self-consciousness and different ideals. Yet these differences, in their emotional and volitional quality, are not so large as the exaggerations of popular opinion and romantic literature would lead us to believe. The instinctive processes upon which the emotions are based are substantially the same for the sexes.

In mental as in physical respects girls mature earlier than boys. They enter and graduate from high school and college younger. Psychological measurements also agree with the biological generalization that the male is more variable than the fe-

male. There are more geniuses of all sorts among men than among women, more distinguished authors, artists, inventors and discoverers; also more low grade types, more defectives and criminals. But even here social and educational influences play a part which should not be ignored. The advance of civilization, with its gradual equalizing of opportunity for the sexes, may tend to obliterate in some measure their differences of mentality.

The Natural Development of the Mind; Interest and Ability.—The duration of human infancy, childhood, and youth is much longer than the corresponding period of immaturity in even the highest animals. Its prolongation appears to be nature's method of preparing the individual for the complex intellectual and social life of the adult. In addition to other features of physical growth, the nervous system undergoes great development, multiplying its connections, retaining the effects of experience by some kind of plastic change, and thus modifying further reactions. Not only do the mental powers naturally ripen; they receive more or less permanent direction, reënforcement and restraint, through the relationships of the family. The dependence of the young on their parents and the associations within the home constitute the primary social and moral training which is needed for later life. This process is continued by the school, and to a lesser extent by other social institutions, particularly the church, clubs of various sorts, and personal friendships. All this, of course, is the combination of environmental forces with those which are inherited.

The various mental functions come to maturity gradually, according to their own inner laws. Passive and spontaneous attention give way to the more effortful type, perceptions gain variety and richness, memory enlarges its scope and includes not only facts but meanings, purpose reaches farther and farther into the future, concrete ideas are supplemented by abstract ones, the power of logical reasoning expands and deepens, instinctive tendencies and emotions appear in due order, complex sentiments are woven around persons and things, self-consciousness assumes a dominant position in mental life, and the characteristic ideals of the individual are established.

This development falls into somewhat distinct periods according to the rapidity of growth of certain physical and mental functions. The periods vary with the individual, but conform roughly to norms, with the years six, eight, twelve, fifteen or sixteen, and eighteen to twenty marking the division points. Girls mature mentally sooner than boys, and are usually a year or two in advance at the termination of their school and college work. The precise mental characteristics of the periods still await conclusive study, but some of their outstanding features are easily recognizable. For example, in the earlier years the mental life is predominantly concrete and objective, with little voluntary attention, command of abstract ideas, or power of reasoning. Between eight and twelve there is an accelerated growth of self-consciousness. The child proceeds to assert its individuality; boys run away from

school and home, girls begin to "put on airs." This is also regarded as the period of most facile habit formation, when personal habits and useful accomplishments can best be mechanized. Routine and drill, if not too irksome, are highly profitable, and fatigue is followed by quick recovery. In the years of adolescence the predominating factors, in addition to the development of more abstractly rational processes, are the ideas and emotions which define social and moral self-consciousness. The maturing of sex functions carries with it a wonderful enrichment of the concept of the self, its place in society, and its relation to the visible and invisible order of the universe. This is the period of formation of ideals, often wrought out through inner and outer storm and stress, as inevitable conflicts appear within experience itself.

The organization of the school has acquired divisions which correspond in a rough way to these periods and their major components; its curriculum also is roughly adjusted to the mental traits which characterize them. That the adjustment is not satisfactory, however, seems to be indicated by the rapid decrease in numbers in the successive grades. Apparently we need a more exact knowledge of the natural development of the mind, along with the study of individual differences of intelligence, and a corresponding formulation of the school program to fit this development. The ideal of education is a harmonious coöperation of environmental influences with the natural dispositions and activities of the mind. It should avoid equally the forcible imposi-

tion of training where there is not the capacity to receive it, and the attractive but false idealism which lets natural impulses take their own wayward course. Its proper function is to stimulate and direct the learner.

Its guiding principle, according to progressive educational theory, is that of *interest,* meaning by this term not mere whim or fancy, but the deeper inclination of the mind toward learning. Interest is nature's sign of readiness to study. Its dynamic power is obvious; interested pupils make conspicuously faster progress than others. Great achievements of scholarship are often distinctly traceable to some early flash of liking for the subject. Whether interest is in itself a sufficient indication of the educational needs of the individual may be questioned; but assuming that he has a natural equipment of appropriate interests, these constitute the best guide for the direction of his learning.

Some study interests are instinctive, or at least very deeply rooted in our nature; such, for example, are the boys' interest in tools and machinery, and that of girls in romantic literature. Most interests are "derived," however; that is to say, they owe their efficacy to their relation to more fundamental ones. The variety of interests which may be acquired as adjuncts of the desire to make an independent living, establish a home, and attain distinction, is remarkable. They carry the worker cheerfully through drudgery which he would not otherwise find endurable. Social interests as expressed in games and competitions, personal attachments, and group

loyalties, are especially important in this respect, resting as they do on deep instinctive endowments of our nature. They can be made the foundation of the whole educational superstructure. Everything which the individual ought to learn may be related in one way or another to these inborn social tendencies. The idea of making the entire school process a development of constructive social interests, of "education for citizenship" in the broadest meaning of the term, constitutes perhaps the most significant contemporary theory of education. It presents a huge practical problem for applied psychology to solve.

As a matter of fact interest often subsides or seems quite lacking when it is unquestionably needed. Here a somewhat anemic and weak-kneed pedagogy advocates letting nature alone, suspecting that interference does more harm than good, and confident that in due time interest will reassert itself. In such cases common sense will continue to use disciplinary measures, relying on the efficacy of the fear of punishment when other interests fail. It is a safe assertion, however, that punitive discipline should be reduced to an indispensable minimum in education, and that so far as possible the teacher should work with the positive instincts of human nature. Fortunately, too, the student can deliberately "take an interest" in dull tasks by force of will, provided he catches some gleam of their ultimate worthfulness.

The Influence of Early Experience.—Educational psychology is placing increasing emphasis on the

early experiences of the child as determinants of its whole later life. This does not signify that inherited traits are negligible, but rather that the direction which they take depends to a great extent upon the influences first brought to bear upon them. According to a somewhat extreme form of the theory, even infantile experience may take root in the mind and remain subconsciously active, with powerful effects in the motivation of conduct. Without theoretical exaggeration, however, there is no doubt that the native capacities and tendencies of childhood are permanently shaped by casual encounter with its varied environment. Jung discovered by association tests that the thoughts of children closely resembled in their elementary constitution those of their parents. This resemblance was especially striking in the case of mother and daughter, whose responses to certain stimulus words were almost always similar and often identical. Thus in one instance, the stimulus "to pay attention" brought from the mother the response "diligent pupil" and from the daughter "pupil," "burn" was followed by "great pain" and "painful," "strange" by "traveller" from both, and likewise "hay" by "dry," "fruit" by "sweet" and so on. Simple and perhaps trivial as this may seem, yet when one reflects on the large number of possible associations which every word has, such a degree of similarity has profound causal significance. It confirms in detail what may be observed frequently in the mental life of a family, that the latter moves in concentric circles about particular interests and ideas. Parents are constantly bending

the associative processes of their children into lines parallel with their own, and thus, it may be, giving lifelong direction to their intelligence.

The doctrine under discussion applies especially to the emotions and the will. The likes and dislikes, attitudes and sentiments first implanted in the budding mind are like seeds which will eventually grow to huge proportions, perhaps ramifying throughout all the varied affairs of life. Courage, honesty, sympathy and other virtues need early inculcation both by word and by example. The imitative tendency soon reaches a readiness to respond almost automatically to good as to bad behavior. Instincts of all sorts, self-preservative, and social, call for recognition and satisfaction, which should be accorded judiciously from the outset. Over-much checking of a child's natural impulses tends to produce chronic hesitancy or covert deeds; ridicule may cut so deep that the wound never heals. Nervous shocks are most emphatically to be avoided. Angry and explosive interference occasionally gives rise to pathological fear. An unreasoning but perfectly natural spasm of fright, inflicted "just for fun," may bear fruit in life-long neurotic disorder. Sex interests and ideas require especially careful regulation. Excessive display of affection toward a child is supposed by some to lead to exaggerated sexuality as instinct matures. Freudian psychology has carried this last principle to absurd lengths, but there can be no question of its fundamental importance. Healthy human nature supplemented by sound training may overcome the wrong bent, but undoubtedly many a

later slip and mishap are traceable in part to wrong ideas and unwholesome tendencies acquired in early childhood.

By inference, some psychologists maintain that the wisest method of dealing with a child is to avoid all restraint of it except where its behavior involves physical peril. Interference is outlawed, as are reproof and punishment. Even "don't" and "must not" are silenced, so serene is the faith that "nature is right," and if allowed to take its own course in the youngster's activity will in the long run produce the best results. This view we may regard as an extreme of paper theory, quite impossible of literal application, yet it has germs of truth. In some cases there is probably too much irksome restraint, and consequently too little opportunity to learn the helpful though sorrowful lessons of cause and effect in the sphere of human conduct. Many childish actions, though irritating, are harmless. Where strong instincts are concerned, demanding expression of some sort, mere frustration is certainly improper. To mention an obvious illustration, a child should not be allowed to play with dangerous things, but it is no less necessary to provide it with playthings that are safe. The desirability of unrestrained natural development is much over emphasized in some quarters, however. Society will inevitably exercise restrictions; civilization will impose checks and prohibitions on impulse; hence appropriate preliminary education of a negative sort is requisite in order to escape hard knocks later. The assertion that a baffled instinct or desire necessarily assumes a danger-

ous subconscious form is a very dubious bit of theoretical psychology.

Nevertheless the importance of early experience is so great that it needs the most careful direction in home and school. Child-training calls for superior intelligence and sympathy, not merely fondness for children or ability to command them. Most desirable are natural insight into the child mind and the peculiar gift of winning confidence, pedagogical powers which serve to prevent repressed ideas, emotions, and impulses from festering subconsciously, by bringing them to the level of free discussion and giving them appropriate expression. Educators are agreed that teachers in the lower grades should be selected with as much regard for special capacity as those in the more advanced ones.

QUESTIONS AND EXERCISES

1. State the general purposes and some of the special problems of the psychology of education.

2. Why is it true that the study of educational psychology does not necessarily make a good teacher or student? What is its value?

3. State the problem of heredity and environment in education. In what principal ways has the subject been investigated?

4. Show how lines of ancestry may be studied with reference to the problem. Indicate the difficulty of distinguishing between hereditary and environmental influences in such cases.

5. What is the general character of the conclusions obtained from study of children in the same family? What is the method employed?

6. How is the problem attacked experimentally? What is the character of the experimental results?

7. Show why the importance of heredity does not necessarily lessen the influence of environmental factors of education.

8. What practical considerations are implied by the results of the study of heredity and environment in education?

9. State some of the principal conclusions concerning the mental characteristics of races. Show how environmental influences may supplement those of heredity in producing these traits.

10. In what ways and to what extent do the sexes differ in their mental processes? How are these differences explained?

11. Show in detail how environmental factors tend to produce different mental characteristics in boys and girls.

12. What does psychology say about the comparative mental variability of the sexes?

13. Explain clearly why the duration of human infancy is so much longer than that of other animals.

14. What is meant by "periods" in the mental development of the individual? Mention some characteristic features of such periods.

15. State the general aim of education in terms of heredity and environment.

16. Show the importance of interest in education. What kinds of interest are basic? Should education depend exclusively on interest?

17. Why is the early experience of a child regarded as highly important for its later development? Give some illustrations of the permanent effect of such experience.

18. What does this view imply as to qualifications for teaching in the lower grades?

CHAPTER VII

THE LEARNING PROCESS

Methods of Learning.—The term learning is used to signify both the development of intelligence and the acquisition of muscular skill. One learns arithmetic and history, concrete facts and abstract ideas, and also learns to talk, to swim, to play a musical instrument, and to use tools. These two types of learning, though distinguishable, are closely interrelated. Generally speaking, intellectual learning is accomplished by some kind of motor activity, and aims toward some improvement of behavior. *To learn is to learn to use,* even if the use be only that of speaking or writing. On the other hand, motor learning is always more or less intelligent, involving perception of objects, conscious direction of movement, purpose, and the awareness of relations. To a great extent the principles of intellectual and practical learning are precisely the same. School work, even to the topmost pinnacles of higher education, constantly involves both forms and practises them together.

All learning is essentially *active.* Never is it a purely passive acquisition, never are its attainment and expression, as too commonly regarded, merely a preliminary movement or a possible consequence.

Psychology constantly emphasizes its active character, the action being either mental or muscular, but in any case an integral part of the process. Even in the most abstract and highly intellectual learning some kind of physical expression is probably never lacking, though it may be no more than inaudible speech or a bodily adjustment so subtle as to elude observation. In the last analysis we learn only by *doing*. The obvious practical implication of this truth is that in all tasks of learning in school, in industry, and in everyday life, efficiency depends upon active performance, usually of a distinctly muscular sort. We shall note numerous illustrations in the chapters which follow.

There are three grades of learning which may conveniently be distinguished according to the degree of complex intellectual activity involved in each. These are what are frequently designated in educational psychology as the principal "methods of learning," namely *trial-and-error, imitation,* and *intellectual analysis.* They are nature's ways as well as human art. They apply to all subjects of learning, from simple muscular operations which require little intelligence to the more complicated intellectual tasks, from wielding a pick or scrubbing a floor to solving a mathematical problem or performing a surgical operation. Usually they supplement one another in various degrees, hence in any given case the correct method is presumably some combination of them.

The fundamental method is that of trial-and-error, the "haphazard way." It is almost exclusively the

way of animals, and also the way of human beings to a much greater extent than we ordinarily suppose. The learner, starting with a more or less vague idea of what he is to do, an idea of the end rather than of the means, tries and tries again, perhaps fumbling and blundering his way along, repeating successes and eliminating mistakes, until he discovers the right procedure. The performance of the average person in trying to solve a mechanical puzzle is a perfect illustration, and our early efforts with tools and machines of all sorts, with golf club and typewriter and automobile, were conspicuously of this character; though it should be added that almost all human learning is more or less complicated by imitative and analytic factors. The primitive method is slow and inefficient, but we never outgrow it. Even in our more intelligent learning we must needs make incidental use of trial-and-error processes. Always the next step is somewhat uncertain; always our successes and failures are our most effective teachers.

An interesting feature of the method is that little improvements of technique, perfected details of adjustment and action, come *unconsciously*. It seems that the guiding idea of the task organizes its own psychophysical machinery to some extent below the threshold of awareness, so that presently we find ourselves doing just the right thing. Defects creep in by the same subconscious route. As Swift puts it, "Even before these forms of response to situations have been noted by the person who makes them, they have become habits of behavior. Unfortunately the person most concerned is usually the last

to discover them." They may, however, be consciously detected, still more easily observed by others, and forthwith emphasized or suppressed according to their value. Hence in learning new arts we often need a kindly critical observer to tell us what to repeat and what to avoid. Good teaching consists partly in doing just this.

But trial-and-error is usually a wasteful process, and also fatiguing and discouraging. It is greatly facilitated by having someone "show us how" the thing should be done. There is in human nature a fundamental tendency, sometimes called an "instinct," to imitate the actions of others. It appears in various degrees of complexity from the child's earliest attempts to talk or write up to elaborate systems of conduct. Concentrated attention upon a movement tends automatically to the reproduction of it by the observer. Especially do visual stimuli set in action the corresponding mechanisms of nerve and muscle, resulting in similar behavior. But the process is not simply mechanical. Most imitation is purposive; in fact the more intelligent the individual, the more reflectively he guides himself by the pattern of others, though the latter may not be his immediate associates. At the summit of human nature is the imitation of the ideal.

From early childhood on through youth and into maturity the process of learning is predominantly imitative. Walking, talking, and all the varied activities of work and play are from the outset learned mainly by copying others. Parents and teachers, friends and acquaintances set us examples from

which we learn what to do in all sorts of situations. The literary depiction of character has the same effect,—witness the response of boys to stories of adventure, or the cultivation of social attitudes and manner of speech in accordance with those of personages in novels. The following of verbal directions is a derivative form of the process; instead of having an actual movement we react to an idea produced in the mind by words. The more we like or admire the demonstrator, the more we are inclined to imitate him.

Some measure of trial-and-error usually persists in the very act of imitation, but the performance is obviously less blind than the more primitive method of learning. On the other hand it has certain limitations. Where good example is lacking it is useless or worse. Where familiar practice proves inadequate it is helpless. Even in imitative learning there is occasional need of improvement, for which it does not provide; and still more in situations which call for distinctly new types of action, learning must follow a different path.

This is found in the intelligent analysis of the problem, dividing it into parts, discovering their relations to the whole, and thus reducing the matter to known principles. The thoughtfulness of mind which accomplishes such analysis with any great thoroughness is rare, but in larger or smaller ways it is the source of most human progress. It appears in typical forms in school tasks and in the work and recreation of everyday life. As illustrations we may mention the solution of a mathematical problem or

the translation of a difficult passage of a foreign language, the studious acquisition of a hygienic mode of life by observing relations of cause and effect in matters of diet or sleep, and the choice of an occupation by examining our capabilities and the characteristic features of the pursuits toward which we are inclined. If society ever learns how to avoid wars and strikes it will be because careful analysis reveals their underlying factors and ultimate futility, and in the light of this truth discovers better ways of satisfying human nature.

When learning involves the fixation of new habits we analyze the task into its parts and practise these separately, usually finding it much easier to imitate correctly part by part than as a whole. Thus a child first learns the partial movements of writing and later whole letters or words. Thus, too, one learns to drive an automobile, performing the movements of hands and feet with clutch, gear-shift, brake, and steering wheel, singly and in combination as they constitute the various maneuvers of starting, turning, stopping, and backing. Likewise one practises service and return strokes in tennis, or driving, approaching, and putting in golf. The intellectual aspect of the analysis may be simple or complicated, more or less abstract and rational, but in all such cases *the right principle is that of mastering the elements of the process and then putting them together.* Perhaps we should add that it is well to perform the whole operation from time to time, both to maintain interest and to test the fixation of the habits.

The three methods of learning ordinarily supple-

ment one another. The writer once observed a group of adults learning to dance, and apparently making use of all three in about equal measure. Always we guide ourselves according to our mistakes and successes, and always we profit by watching others. The analytic method expedites our efforts, avoiding blunders, saving time and energy. Its results may of course be made the basis of imitative learning which is still quicker. As an illustration of the comparative values of the different methods Scott mentions an interesting case of the solution of an intricate mechanical puzzle by four persons. The first, by trial-and-error, took eight hours, and only after several lengthy repetitions could do it quickly. The second, having watched the first, did it in two hours. The third, an expert mechanical engineer, studied the principles involved and solved the puzzle in half an hour. Using his knowledge he then taught the fourth to do it in fifteen minutes.

The practical aspect of the matter may be summed up by saying that in all learning we should reduce the trial-and-error process to a minimum. This means that we should look for good examples to copy and observe them with care, or, as teachers, set them for others and judiciously criticize their performance. Most persons doubtless get less expert instruction of this sort than they deserve. Further, we should inculcate the mental habit of dealing with difficulties analytically, so that we grasp their details and note the principles which are involved. The reader of these pages may find it both interesting and profitable, when next he under-

takes to learn some new accomplishment, to do so more observantly and thoughtfully than has been his practice in the past.

Habit.—Learning assumes the permanent form of *habit.* Mankind like the rest of nature tends to do the same thing over and over again, almost always finding the path of least resistance in what he has done before. Eventually he becomes little more than a "bundle of habits," to use James' apt phrase; these largely constitute his everyday life, occupation, morals, and personal character. The advantages of habit, to borrow from James again, are that it facilitates reactions, simplifies them, reduces fatigue, saves time and energy. In its physical forms it dispenses with attention, and thus leaves the mind free to direct consciousness elsewhere. Obviously we have here an exceedingly practical topic of applied psychology. In fact most prescriptions, whether of psychology or of common sense, having reference to education or health or business, are supplemented by the further direction, "get the habit." On the other hand it has manifest dangers which hardly need explication; in every human life it is a source of sorrow as well as of satisfaction. The effort to escape it is sometimes tragic. The whole subject is so familiar that we need only a brief review of its principles.

The physical basis of habit lies primarily in some modification of groups of elements of the nervous system, probably some molecular change especially at the "synapses" or points of connection between neurones, which facilitates the transmission of cur-

rents of nerve energy. Thus learning is constantly sinking into our bodily organism; indeed the process of nerve modification goes on after action has ceased, so that when we perform the operation next time, for example playing a game, it is easier. Physiologically we learn when we are resting, when we are sleeping; we continue to learn one thing when we are actively busy with another. Bad habits no less than good ones are settling in us inexorably even though we seem for the time to have passed out of their sway.

Childhood and youth are naturally the best period for the formation of habits, especially those of an everyday personal character, including language, arts of dexterity, esthetic appreciations, and elementary morals. These, according to James, should be acquired by the age of twenty. If we do not establish in ourselves during these years ways of cleanliness and punctuality, musical proficiency and athletic skill, liking for reading and especially for poetry, we probably never will do so. Intellectual and professional habits should be settled by thirty, though of course their foundation needs to be laid earlier. Habit may be formed in later years, but only with much greater difficulty.

The principal rules for the deliberate formation of habit, as stated by James, are as follows: First, *Launch yourself with strong initiative,* resolute determination reënforced by such favorable conditions as you can bring to bear on the effort, for example a public declaration of purpose. Second, *Avoid exceptions,* at least until the new habit is

firmly rooted; penalizing yourself for lapses, by fine or otherwise, may prove effective. Third, *Seize opportunities for practice,* actively grasping instead of passively accepting them, and never allowing emotional promptings to evaporate before being turned into action. Fourth, *Cultivate the faculty of effort by a little gratuitous exercise every day,* doing something that is disagreeable or refraining from something that is attractive simply for the sake of developing moral muscularity.

This last point brings to the fore the question of the possibility of forming "general habits." It appears that such habits may be formed, as types of thought and action which apply somewhat variously to similar situations. Thus one may acquire the habit of cheerfulness under difficulties, or a habit of neatness which manifests itself in dealing with any kind of material. Habits do not necessarily assume such a general form, however; they may remain specialized and particular, sometimes inconsistently so, as in the case of a man who is gentle in his own home but harsh toward his employees, or careful in one kind of work and careless in another. Yet there is a natural tendency for a particular habit to spread its operation throughout life. Special habits may also be generalized in some degree by having their essential idea and possible breadth of application brought explicitly to consciousness. Discerning their significance and value, we extend them to adjacent fields.

Not only may an old habit be replaced by a new one, but both may be retained and used on occasion.

As a simple experiment Münsterberg carried his watch in a pocket other than the usual one, and noted the number of times he sought it in the old place before he acquired the correct habit. Then returning it to its former position he gradually regained the first habit, though with occasional mistakes. Repeating the performance several times, he discovered that the number of errors rapidly grew less, until at length the initial act and mental "set" or direction sufficed to call the right mechanism of habit into play. The learning and use of different foreign languages is a complex illustration of the same principle. Other illustrations are occasionally found in industry, as for example the garage man's easy manipulation of different gear-shifts in automobiles. In all such cases the various habits, though mutually exclusive, do not interfere with each other in actual operation.

Rate of Learning; the Plateau.—A distinct group of problems in educational psychology has reference to the rate of learning. Individual differences in this respect are exceedingly striking. Some persons accomplish in a few minutes what others, by no means defective in intelligence, require hours to master. Experienced scholars gather the substance of books and magazine articles with a rapidity which is astonishing, partly of course by reason of their previous acquisitions, but also because of natural ability. The ease with which some students in college learn assignments remains a baffling mystery to those who labor patiently for long periods over the same work.

For efficiency, one should learn at the rate which is naturally easy for him,—an assertion which is less a truism than it appears. A rapid learner impedes himself by going slowly, and it is still more obvious that the effort to speed up in study results in a superficial skimming which gathers little. Too crawling a gait leads to wandering of attention and loss of connections; too rapid advance produces vagueness and mistakes. In intellectual work as in running, one goes farther in less time by taking the right pace and sticking to it. This truth applies not only to single tasks, but to whole courses of study as well; in progress from week to week and month to month in literature or science it is important neither to hurry nor to dawdle. Hence as far as possible students of different rates of learning ought to be freed from the handicap of being compelled to take each other's pace. As practical consequences wherever feasible, sectioning of classes and extra assignments for the more brilliant are desirable.

It is to be observed, however, that the rate of learning does not bear any uniform relation to retentiveness. Against the common supposition that easy learning makes easy forgetting, and the opposite, the experimental studies of the psychologist seem to show that human nature comprises all four possible types; the quick learner and slow forgetter, the slow learner and quick forgetter, and those who are quick or slow in both processes.

Progress in learning, either intellectual acquisition or improvement in skill, is seldom continuous. Generally speaking, the learner proceeds irregularly.

Sometimes there is rapid advance at first, followed by discouraging arrest of progress; sometimes initial difficulty gives way to speedier momentum. Slight variations of performance, little jumps and "sags," occur from day to day. Protracted spells of unimprovement and even serious depressions of accomplishment appear unexpectedly. Not all persons experience these variations in the same way, nor do they characterize all subjects of learning in the same degree, but in one form or another they are very common. Probably everyone has observed in himself some such irregular rise or fall or dead level of attainment. Exact studies of the rate of progress in various kinds of mental and physical learning, ball-tossing, typewriting, marksmanship, mastery of foreign language, and the like, all show zig-zag lines of improvement. The number of hits and misses, or words written or translated correctly, gives when tabulated in relation to time the so-called "curve of learning."

A long period of retardation, perhaps lasting several days or weeks, is termed a "plateau." It appears occasionally in both the schoolroom and the workshop, in the activities of the mind as well as in the development of manual skill. It is discouraging, especially to a child, and is the cause of much antagonism to school work and many changes of industrial occupation. Kitson appropriately calls it "the plateau of despond." Frequently it gives way to a new rise in capacity, which in turn may be followed by a further level.

Plateaus are due to at least four different causes.

First, there is likely to be a waning of interest and enthusiasm as the novelty of the task wears away. One's attitude becomes less alert and vigorous, whereupon the mechanism of mind and body forthwith falls into a routine which is felt to be dull and unprogressive. Second, new difficulties cause a slowing down. Learning may be regarded as a series of connections in the nervous system which are becoming habitual, some readily, others only with effort and the lapse of time. The learner naturally establishes the easier ones first, and when he has done this he finds his progress stopped. Third, in the course of learning one sometimes accidentally acquires bad neuro-muscular habits, inaccurate perceptions, and imperfect adjustments which constitute impediments until they are eliminated. A bit of awkwardness in handling a tool, for example, may have such an effect. Fourth, the plateau may be analogous to a period of rest, needful after the preceding rise in capacity, and indicating that the gains already made are being established in the nervous system. New connections must "set" before others can be added. Doubtless in some cases several of these factors operate together to produce the phenomenon.

How may one avoid plateaus, or if they come, how may one advance beyond them with the least delay? Answers to this question run along different lines. In so far as the retardation is due to a need of consolidating attainments, patience is the primary requisite. Eventually, as many of us have discovered in our own cases, the bafflement comes to

its natural end, and is succeeded by an encouraging improvement. In the meantime we can turn our attention to other matters, or other parts of the work before us, and make progress there. If, however, it is the result of special obstacles or of defects in previous learning, there is need of careful analysis of the difficulty, and methodical attack or elimination of inhibitory factors. Finally, advance may be stimulated by new incentives. Fresh consciousness of purpose or a new and definite statement of aims may serve. Rewards and punishments are of course occasionally effective. It is an interesting fact that a change of environment, e.g., transfer to a new school or a new office, sometimes produces marked improvement as its novel stimulations are brought to bear on the personality and a new sense of responsibility develops. In any case the plateau should be looked upon as the mechanical effect of certain causes; and the treatment of it should proceed from the same mechanistic point of view. Probably a judicious selection and mixture of the above methods is usually desirable.

Transfer of Training and Formal Discipline.—No problem of education is more fundamental or has been more thoroughly discussed than the one indicated by the title of this section. To what extent may training be "transferred" to another field, or to a different kind of subject matter from that in which the training was obtained? Of course mathematical training makes good mathematicians, and legal training good lawyers; but does the study of mathematics help to produce proficiency in law?

Does the memorizing of the vocabulary of a foreign language with its declensions and conjugations help one to remember historical facts? Does philosophy tend to make a student thoughtful? Does college education increase commercial ability? Does it render its graduates better able to deal intelligently with the varied problems of everyday life? Evidently the proper form and value of our whole educational system depend in some degree upon such questions. Much of the familiar curriculum of school and college can hardly be justified by any prospect of direct usefulness. It finds its justification in the increased intellectual acuteness, broader comprehension, and superior rationality which it is supposed to produce. But does it really have this effect?

There has been a vast amount of controversial discussion of this matter, most of it the expression of prejudice rather than of studious acquaintance with the facts. Efforts to settle the question scientifically have followed two main lines, one statistical, the other experimental. First, in so far as the problem refers to the transfer value of various *subjects of study*, investigators have made interesting comparisons of the school records of differently trained groups of students. For example, the subsequent scholastic achievement of those who have and those who have not had classical or advanced mathematical training has been carefully noted; and the previous training of superior students in technical schools has been studied. Similarly the correlations between foreign language and English have been

ascertained, and so on. No very conclusive results have been established, however. There are so many complicating factors, such as differences of native ability, the possible bearing of concurrent study of other subjects, home influences and personal relationships between student and teacher, that we cannot be sure about causes and effects. Such differences in later accomplishment as actually appear are small, and possibly due in part to other factors than the special training in question. The evidence of transfer is clearest where the field of later work is akin to that of the training, or resembles it in method of study.

A more promising line of investigation is that which attempts to ascertain by experiment whether training in a *specific mental function* is transferred, either to a different kind of subject matter from that in which it was gained or to the operation of a different function. Does practice in discriminating weights increase ability to discriminate tones and colors? Or does the memorization of nonsense syllables help one to do arithmetical operations? The experimenters have studied various sensory and motor functions, attention, discrimination, memory, orderly arrangement of objects, muscular rapidity and accuracy, and the like, with reference to this problem. The method of experimentation is as follows: Two groups of persons, of sufficient numbers to possess the same average ability, are trained, let us say, in learning poetry, and their rate of learning is recorded exactly. Then one of the groups, but not the other, is given training doing arithmetical

sums or in some other mental process more or less different from that of learning poetry. Both groups are then set at work again at the first kind of task, and their rates of learning are compared with each other and with their original performance. If it appears that the group which had the intermediate training has made greater improvement in ability to learn poetry than the other group, this superiority must be due to the intermediate arithmetical training. In other words there has been some transfer. Careful procedure usually indicates that in some slight measure this is the case.

If we try to summarize the results of the long series of statistical and experimental investigations we may say that they tend to establish these principles:

(1) Transfer of training takes place from field to field and function to function, but is variable in amount, and in general is much less than is commonly supposed. Training of any sort may increase skill along other lines. The extent of the transfer of training depends upon various conditions.

(2) It is greatest where there is a close resemblance between the fields or functions. Common elements of subject matter, linguistic, mathematical, historical, and the like, naturally facilitate the transfer. Such similarities, often subtle, are more prevalent than appears at first to be the case. Hence almost any subject may prove useful with reference to almost any other.

(3) Habits of study, for example attention, reflection, persistence and thoroughness, may be trans-

ferred quite independently of the subject studied. They are not necessarily transferred, however, since independent factors of interest and volition also operate. Doubtless there is often a greater increase of ability than is actually exercised.

(4) Transfer is facilitated by making it an explicit purpose. The student who understands the transfer-values of a subject, and studies with the intent of acquiring these, is more apt to apply his learning in other fields.

(5) The extent of the transfer depends in part upon individual differences of intellectual character. Some persons perceive relationships more easily than others, study with a broader grasp and a farther reach of purpose; and in consequence apply their learning much more widely.

These conclusions are vague and unsatisfactory, but unfortunately they cannot be stated more exactly under our present conditions of knowledge. The point which is most certain is that preëminence in any line is best obtained by appropriate training in that line, though the preliminary training may differ markedly in either subject matter or method, provided it possesses the requisite functional resemblances. Direct training produces experts, but it does not necessarily produce broad-minded men and women or good citizens. Since life has too many diverse aspects to permit of direct training for all, we are forced back to the question, What subjects afford the best general training, i.e., have the widest transfer value or constitute the best "formal discipline"? Answers to this question are mainly

the expression of tradition and general impressions. Ignoring the problem of relative values, we may acknowledge that all subjects, classics, mathematics, science, modern language and literature, history, philosophy and psychology, have their respective merits, sufficient to make them desirable means of intellectual training. This training depends quite as much upon the learner's attitude and the way the subject is taught as upon its intrinsic nature. The main kinds of educational value, namely practical utility, cultural information, and discipline, inhere in the form of the training quite as much as in its subject matter. There is no subject which necessarily gives any large amount of formal discipline, though almost any subject may do so in individual cases.

QUESTIONS AND EXERCISES

1. What is meant by the "active character" of learning? Show that intellectual as well as motor learning has this character.

2. What are the principal "methods of learning"? Illustrate each. Show by an illustration that learning may combine all these methods.

3. What are the advantages and disadvantages of "trial-and-error"? What is the "unconscious" character of such learning?

4. Distinguish, using illustrations, between automatic and purposive imitation. Whom are we most inclined to imitate?

5. In what respect is imitation inferior to analysis? Show that analytic learning makes incidental use of the other methods.

6. What practical applications with regard to teaching and learning are suggested by these methods?

7. Try to find some task of learning, either intellectual or practical, to which you can apply these principles.

8. What is the relation of habit to learning? What are the advantages and disadvantages of habit?

9. What is the physiological basis of habit? Show that the formation of habit is partly unconscious.

10. What kind of habits need to be formed earliest? When should professional habits be formed? Mention illustrations.

11. State James' rules for the formation of habit.

12. What are "general habits"? Give illustrations of general habits which are especially important?

13. Show that a person may possess two quite different habits with reference to similar situations.

14. What is the most effective rate of learning? How should personal difference in rate of learning be recognized in school work?

15. What is the relation of retentiveness to rate of learning? To which class in this respect do you belong?

16. What is a "plateau"? What are its causes?

17. How should a plateau be treated in order to overcome it?

18. Practice some more or less complicated movement until it becomes habitual, e.g., writing with your left hand, or a new stroke in tennis. Note your rate of progress in learning as measured by the time taken or the number of mistakes made.

19. State the meaning of the terms "transfer of training" and "formal discipline." Show the importance of these ideas for education.

20. How is the subject of transfer of training investigated experimentally?

21. What are the principal conclusions of educational psychology with reference to transfer of training and formal discipline?

CHAPTER VIII

INTELLECTUAL EFFICIENCY

Possibility of Improvement.—The problem which now confronts us is, How can we increase intellectual efficiency? To what extent can we improve the power of studious concentration, scope and accuracy of memory, fertility of imagination, and soundness of reasoning? What does educational psychology tell us about methods of intellectual training? These questions are highly important both for school systems and for professional life in general. Observing as we inevitably do the striking differences among individuals in these respects, and the consequent differences of successful attainment, we cannot but feel the need of acquiring as thoroughly as possible the ways of the expert scholar.

It must be acknowledged at the outset that in certain fundamental respects the intellectual functions are improvable only slightly if at all. The sensory acuity of eye and ear, of tactual and kinesthetic sense organs, "is what it is." Nature has bestowed upon every individual a certain degree of sensitivity, and this is probably not subject to much change. The molecular structure and conductivity of the nerves belongs among these innate qualities which serve as fixed fundamentals for the superstruc-

ture of intelligence. Favorable conditions may result in their functioning with maximum precision; age and poor health may affect their working unfavorably. But in any case they have natural limits of efficiency. Similarly with regard to the functions of reproductive association. These depend primarily upon a retentiveness of brain which is an original capacity, one might metaphorically say a particular degree of "stickiness," as it were, for the holding and releasing of facts. And so it is with the fluency of the associative process. Some persons naturally possess good memory or brilliant imagination while others have to get along with poorer equipment. The differences are not so simple as may at first be supposed, but they should be understood as in some degree fundamental. Likewise the powers of thought, precision of judgment, inclusiveness of conceptual synthesis, certainty of inference, have a facility which varies among individuals and determines the limit of possible improvement. Some minds are essentially logical; others are conspicuously given to crooked thinking. A few persons are "born mathematicians," most of us distinctly are not.

The foregoing statement may seem discouraging, but it is really less so than it appears. Even though our mental machinery is fundamentally unchangeable our *use* of it may be improved. It is possible to develop an expert operation of the mind, just as genuinely as an expert operation of a lathe or a motor, however limited the capacity of the instrument in question. Most of us could accomplish far

more with our cerebral mechanism than we ordinarily do. Such perfecting of use may be sought along several distinct lines. First we shall consider the *improvement of attention* by regulating the conditions, external, bodily and mental, which are requisite for the sort of "concentration" that characterizes intellectual efficiency. Second, there are certain *methods of memorizing* which distinguish the expert scholar. Working principles of memorization and recall are especially important since in every occupation we depend constantly upon the conscious use of past experience. Third, there is something to be said with regard to the possibility of cultivating imaginative thinking, evaluative judgment, and inferential reasoning, in a word the *thought factors* of efficiency

Conditions of Concentration.—Whatever other characteristics the efficient intelligence possesses, it is first and foremost *attentive.* In whatever work it is engaged, whether sensory observation or abstract reflection, it is concentrated, persistent, and as a state of consciousness it is correspondingly clear. No successful mental pursuit is possible without it. The complex processes of perception, memory, imagination, and reason depend upon it for their effectiveness. What are the conditions which make for steadiness and continuity of attention?

In answer to this question we proceed from the principle that *attention is mainly automatic.* It is not only the natural reaction of the mind to certain stimuli, but also it is correlated by age-long inheritance with a wide variety of physical and mental

conditions. For our practical purposes we may conveniently divide these into three groups. The first includes such physical and environmental conditions as temperature and humidity, light and sound, persons and things, food and drink, drugs and stimulants. The second comprises the immediate physiological factors and specialized bodily adjustments, the direction of sense organs, rate of breathing, general muscular tension and relaxation, supply of blood to the cortical centers, digestion, and the state of fatigue. The third group is constituted by the distinctly mental conditions, the instinctive and acquired interests and purposes, like and dislikes, fears and desires. Since attention of all sorts, voluntary, involuntary and non-voluntary, mechanically expresses the interplay of these conditions it may be controlled and improved in some measure by regulating them.

We have all observed that it is harder to study, or perform exact mental operations, like figuring, in a hot, close room than in a cool, well ventilated one; that reading quickly becomes uncomfortable if the light is either too brilliant or too dim; that noise is distracting; that heavy eating makes one sleepy, whereas strong coffee produces wakefulness; that the mere presence of persons, and especially the movement of persons or things near us, lures attention away from its proper object. Applied psychology states these observations in a definite form and thus enables us to formulate rules for methodical mental work. Some careful studies have been made of the effect of environmental conditions upon atten-

tion.[1] Mental operations have been precisely measured under specific circumstances, and their results tabulated with considerable exactitude. They confirm and in some measure correct the opinions of common sense in these matters, and serve as a basis for regulating conditions in school and elsewhere. Changes in the position of desks, periods of study, and processes of ventilation are shown to be desirable by psychological investigation. Experimentation also brings to light individual differences of much importance. There are morning, afternoon, and evening workers,—persons whose power of sustained attention rises to its maximum at one time of day or another. With some a slight amount of distraction, for example noise, serves to stimulate additional effort, which not only overcomes the interference but results in a net improvement.

The practical implication of these truths is that we should ascertain the conditions under which we can work to best advantage, and habituate ourselves to them. *Deliberate avoidance of seriously distracting conditions is of the highest importance.* If we cannot altogether escape those insistent noises to which modern industry subjects the worker, the rattle of machinery, the click of typewriters, the clang of street cars, and the braying of automobile horns, we can lessen their intensity in some measure by study arrangements, and thereby help to make ourselves indifferent to them. When we study, either singly or in groups, we ought to isolate ourselves or insist that other persons shall remain quiet. It is well, of

[1] Hollingworth and Poffenberger, *Applied Psychology*, Chs. VI-IX.

course, to be able to ignore intense or persistent distractions, but since they exert a subconscious influence even when we do not attend to them we should eliminate them so far as is possible.

Turning now from the environmental conditions to those which are functions of the bodily organism, we are aware that attention is connected in the closest way with various activities of the nervous and muscular systems. For example the eyes or head may be turned, the body held rigid or relaxed, and there are also complex and intricate changes in circulation and breathing. Broadly speaking, these activities are such as to bring the organism into adjustment toward its object, and so conduce to maximum clearness of consciousness. Some of them are under voluntary control, others not. What we particularly have to notice is that certain kinds of activity which we may execute voluntarily, other than the adjustment of sense organs, serve the purpose of facilitating attention. It is easier to keep our minds on a subject if we write or speak or perform some other appropriate action. One can listen to a speaker more steadily when one repeats to one's self the words of the discourse, and the same is true of reading dull and prosy literature. Note-taking helps likewise in both reading and listening. The motor processes of speech, spoken or written, are so inseparably correlated with the function of attention—in other words, that which we talk about we always have most clearly in mind—that merely setting them into action tends automatically to switch the nerve currents to certain centers and thereby to

focus the mind upon the subject of speech. This method is sometimes easier than the direct control of the sense organs themselves.

The relation of fatigue to attention has been studied with experimental thoroughness and precision. Fatigue involves certain physiological changes, particularly the disintegration of the cell body, and the accumulation of waste products in the blood and muscle tissue. Its effect is to render attention unsteady and the resulting movements inaccurate. In operating machinery this may become a source of great physical danger, and in mental occupations it occasions serious errors of one sort and another. In general, workers ought not to subject themselves to a continued strain of attention when weary. Of course it is unwise to indulge in hard physical exercise before undertaking intellectual tasks. Afternoons of football practice are not conducive to evenings of study. Since attention itself produces fatigue it follows that protracted study periods or successive class hours need intermissions of rest. But it should be added that *much apparent weariness,* especially in intellectual pursuits, *is not genuine fatigue.* As the point has been concisely put, one is not really tired *by* his work, but only tired *of* it. This is essentially a mental difficulty, and it leads to a further aspect of our problem.

The third kind of condition is distinctly mental; it is the purpose or attitude, the emotion or resolution, the transitory excitement or the "habit of mind," which governs the course of the stream of consciousness. These conditions may be summed up

in the single word "interest," and the important psychological principle which we have to observe is that interest greatly facilitates attention, not only directing it but also lessening in a remarkable degree the consequent fatigue. There is a biological reason for this. Nature has evolved the mind as a means of protection and satisfaction, hence consciousness tends to become clear in relation to such ends. Age-long inheritance and early education combine to make us attentive to what is novel or changing, to what is difficult or dangerous, to what calls for the exercise of our powers, to what is pleasant, to what promises future reward. Everyone has observed in himself or in others the phenomenon of becoming interested in something, a book or a bicycle, a game or a girl, and therefore unfailingly attentive to it, or more especially to her! The causes of such interest lie deep in one's physiological constitution, individual history and social relations. Its manifestations are perfectly obvious, however. It produces persistent, unflagging, unwearied attention to the fascinating object or person.

Some of our interests are innate, instinctive; such for example are those of food getting, ownership, and social relations. Many are derived, and dependent for their life on those of a more fundamental sort. This is particularly true of the study interest. Few persons are like Huxley, who reports himself as never failing to find a subject of study interesting. Most of us study to gain some adventitious end, to avoid punishment, please teachers, make a living, or acquire fame. But for these springs of

interest life would lose its studious energy. Their pressure keeps us at our work.

The practical implication of this truth is that in order to make ourselves attentive to an uninteresting task we need to relate it deliberately to some fundamental interest. *Work in the light of aims which are essentially interesting* is the psychological prescription. We are likely to give too little thought to the fact that the dull job which confronts us, perhaps one of monotonous routine, is instrumental to something which we ardently desire. We are inattentive because we don't see—and this means frequently that we don't take pains to see—what it really amounts to. Did we perceive this ultimate value we would give earnest attention to it. The question which we need to ask in many a moment of mind wandering is, How does this bit of wearisome labor lead toward the position among my fellow men which I want to occupy? Probably fifty per cent of the inattentiveness of college students in class and private study could be removed by frankly facing this question.

The psychological truth that interest automatically produces attention has sometimes led pedagogy to the wrong inference that all subjects of study should be interesting, or even that lack of interest in a subject on the part of a pupil is a sign that he ought not to study it. This is nonsense, of course. Studies ought to be interesting, and it is the proper business of the teacher to make them so, but children cannot be expected to appreciate the ultimate importance of their labor, nor is the spon-

taneous interest of older pupils a sufficient guide. Desire for rank or reward, fear of punishment or of failure are in some cases indispensable as means of holding attention to the task. At best a great deal of grind is inevitable, the dullness of which is only partly relieved by our knowledge of its usefulness. We cannot expect interest to make attention unfailingly pleasant. We can only employ it as shrewdly as possible to develop attention as a mental habit. Fortunately, persistent attention usually tends, by reason of the mastery which it produces, to become agreeable; we can usually, by deliberate determination, *take an interest* in our work which richly repays the effort.

Large accomplishment depends upon steady attention, but when work calls for new ideas, or when problems stand in need of various suggestions toward solution, it must be acknowledged that the best way to obtain these is sometimes simply to turn to other things. The matter thus dismissed germinates subconsciously, and eventually thrusts itself above the threshold of attention in a sudden and seemingly illogical fashion. Illuminating ideas burst into consciousness spontaneously after the laborious effort to produce them has failed. Apparently individuals differ somewhat in this respect. Genius is notoriously given to mind wandering, which somehow results in brilliant fancy and purpose. But genius is also "an infinite capacity for taking pains," i.e., in executing attentively the plans which mysteriously emerge from the subconscious depths of the mind. Hence we may close this sec-

tion as we began it, with the assurance that the power of concentrated attention is requisite for intellectual efficiency.

Methodical Memorizing.—The second phase of our problem is that of "learning." This term, as we have seen, covers both the process of memorization and that of acquiring muscular skill. It is with the former that we are concerned here, though in most tasks of learning the two processes are closely related, and the rules which apply to one kind serve also for the other.

Learning, in the sense of *committing to memory,* is a basic part of all intelligent pursuits. Not only is it the main burden of school work, but later occupations of all sorts constantly depend upon it for efficiency. The business man has to remember names, figures, and other details; the learned professions are characterized by masses of facts and principles to be borne in mind. While memory is not the highest mental function it is one which we are continually using. Individuals differ greatly in their possession of it; some remember easily, tenaciously, others only with great difficulty and uncertainty. Most of us lament our weakness in this respect and desire a more reliable habit of mind.

Memory involves the retention, recall and recognition of what has been perceived or learned. It depends in part upon the native retentiveness of the nervous system, partly upon special conditions at the moment of recall, and most importantly upon the way in which the remembered fact was learned. Our primary question then is, How can we learn

most effectively, that is to say with maximum permanence and possibility of recall?

Observation and experiment have established several principles which afford guidance to the learner. They may be enumerated as follows:

(1) Learning is greatly facilitated by *interest.* We acquire quickly and tenaciously the subjects in which we are naturally interested. The fact that we like them helps to fix them permanently in mind. Devotees of science and literature amass astonishing wealth of scholarly information, and students who are quite innocent of any scholarly purpose sometimes exhibit a ridiculously capacious memory for athletic records. Where natural interests of an intellectual sort are lacking, practical ones may serve. Vocational aims, social relationships, ambition, rivalry, coöperation, these and other powerful motives reënforce the energies of learning and make it effective.

(2) *Purpose.*—It has been conclusively proved by experiment that the mind's acquisitions are held more securely when studied with the *aim of retaining and using them* than when merely understood. There is a way of grasping facts intentionally "for keeps" which tends to have precisely this effect, whereas admission of the thought "I shall probably forget this" produces the expected result. The mental attitude of learning something simply for purposes of examination implies forgetting it when the ordeal is past. Eleventh-hour "cramming" is notoriously fruitless beyond its immediate use. On the other hand one can study with a mental attitude

which looks indefinitely into the future and signifies life-long retention.

(3) *Concentration* upon the material to be learned with such attention as gives it maximum vividness and intensity results mechanically in permanence. The habit of lax attention in study is one to be carefully avoided. Many a poor student suffers not from lack of intelligence, but from acquired inability to concentrate his mind upon his work.

(4) *Repetition* drives a point into the mind as the successive blows of a hammer drive a nail into a board. Two or three readings of a chapter are much more valuable than a single perusal. Reviews of all sorts are quite as important as the original attack.

(5) *Distribution.* Experiment demonstrates clearly that it is well to divide the process of learning into periods separated by intervals during which the results of study have time to "set" in the cells of the nervous system. One accomplishes more by studying a subject an hour a day for a week than by devoting six hours to it at a stretch. The proper length and frequency of the period varies with the age of the individual and the nature of the subject. The steady modification of the nervous tissue whose functioning underlies intelligence, for example the regular business of preparing for a class which meets on alternate days, cannot be matched in effectiveness by any amount of concentrated study. Here, by the way, is another reason why cramming, in any other sense than that of a final review, is futile.

(6) *Large units* are preferable to small ones. To

take an extreme illustration, a chapter should be read entire rather than studied sentence by sentence. Learning poetry line by line is less rapid than learning it by reading a long passage over and over again. In general we ought to try to grasp things as *wholes* instead of bit by bit. The latter method overemphasizes certain parts, neglects connecting links, and fails to get the unitary synthesis. If some parts are especially difficult we can return to them when we have grasped the main structure of the whole unit.

(7) *Logical association* is perhaps the most important principle of all. We hold what we learn much more tenaciously when we relate details to one another and to what we have learned before. Thus we may place facts in their proper order, find illustrations of general principles, look for causes and effects, note resemblances and differences, connect new acquaintances with the occasion of meeting them, assign future duties a definite time and place, and so on. Systematic relationships not only fix our acquisitions more firmly in mind, but also afford various associational pathways which facilitate recall.

(8) *Action,* i.e., a motor process of some sort, is also most helpful. We learn a thing more successfully by saying it aloud, or silently to ourselves, or by writing it down. Names and dates are fixed in mind by actual utterance. Declensions and conjugations should be both spoken and written. Scientific classifications and general information are impressed upon our minds by the act of imparting

them to others. Telling ourselves the substance of a chapter is much better than merely understanding it as we read, and in any task of learning the effort to recall orally what we have studied goes far to establish it in the mind. Words, even in recitation, examination, and note-taking, may be mere parrot talk, however. If the learning process involves drawing, manual training, or laboratory work, so much the better. These motor performances help the memory as they do the understanding. "In general," says Whipple, "use in your studying the forms of activity that will later be demanded when the material is used."

As further illustrations of these rules we may indicate the following typical tasks of learning and appropriate methods of dealing with them. (a) In order to remember a person's name, *form a close mechanical association of the name with the face.* Pronounce the name aloud in acknowledging an introduction, and at the same moment fix the face in mind by concentrated visual attention. If the name has any peculiarity, and especially if it suggests some personal trait, e.g., if Mr. Robinson's first name is Robert, or if Miss Long happens to be either tall or short, fix this linkage in mind;—the more absurd it is, the better! Later repeat the name aloud several times while recalling the face with as clear a visual image as possible. Address the person by name occasionally, at least remind yourself of it whenever you meet him. If you find that it has slipped your mind, regain it as soon as possible, perhaps by asking someone else, and again take

measure to impress it on the memory. Cultivate self-confidence in the matter by noting every success and taking pains immediately to correct failures. But first and foremost, and as often as possible, connect the visual image of the face with the sound of the name by actual pronunciation.

(b) In committing prose or poetry to memory verbatim, one should make the attack by reading the passage aloud several times, perhaps five or six, taking care to grasp its meaning but not trying to test one's recollection of it. If it is not too long read it as a whole, otherwise divide it into as few and large sections as possible. Observe the general character and unity of the whole or of each section, and read with concentrated attention. Note any obvious inner relationships, logical sequences, and the like, which may serve to tie part to part in your apprehension of the whole. Then begin to repeat the passage, continuing until recollection fails, bridging the gaps by referring to the text, and so proceeding to the end. If there are points of special difficulty, pay special attention to memorizing them. "Distribute" the process of learning over several periods, spending from a few minutes to an hour a day at the task according to its length. If the poem or address is to be spoken to an audience, practice delivery with the feeling and mental picture of the audience confronting you. Fix the *value* of the performance in mind, and assure yourself orally of your ability to execute it, so that these factors of confidence will work subconsciously. In short, hammer the material into the memory mechanically as a

series of associations which express an important idea.

(c) In studying a chapter in order to master its contents, but without the need of verbatim memory, begin by ascertaining its general purpose and character. Note the chapter title, table of contents, paragraph headings, and the like, so that the outline of the subject or the direction of the discussion is present in anticipation. In some cases a rapid preliminary reading is desirable. Next read the chapter carefully, thoughtfully, taking pains to make clear any obscure portions, pausing to restate in brief the substance of paragraphs or sections, observing the logical development, interrelation of parts, and so on. It is an excellent practice, of course, to make a written outline of the chapter, or at least to underline or otherwise mark its main points. If the material is historical try to visualize occurrences, if expository supply illustrations, if argumentative criticize and evaluate its assertions. Reread the chapter and ask yourself questions about it. Review its principal features in memory, and thus cultivate a feeling of mastery of it. If necessary, endeavor to make the matter interesting by an act of will, assuring yourself of its direct or indirect educational importance.

Learning is ordinarily sufficient for recall. That is to say, if one has really learned a thing he will remember it when it is needed. Those who forget are usually the ones who have not memorized properly. We must admit, however, that there are plenty of instances when our knowledge refuses

momentarily to come to mind. Something which we intended to buy has escaped us, though we shall recall it when the opportunity of purchase has passed. The familiar face is embarrassingly nameless, but an hour later when we are thinking of something else we shall find the name upon our lips. The answer to an examination question lies hopelessly in the dark, yet when one has handed in his paper and left the room the slight reminder brings the missing fact to mind like a flash of light. Recall is such a mechanical process that voluntary methods of accomplishing it can hardly be said to exist. Yet forgetfulness may be avoided in some measure by searching persistently for associates of the desired item. The relationships mentioned above as useful in learning are ready to function in recall if given an opportunity. *Something about* the hidden fact ultimately drags it into view. The name is discovered by experimenting with initial letters until one with the right "feel" is found. The forgotten errand appears when one runs over different phases of one's daily life. The answer to the question floats into consciousness on a tide of thought about the subject in general.

Inability to recall what we know is increased by nervous tension. Often the difficulty is due to the obstinate refusal of some unsought fact to give place to the desired one; activity in one nervous center inhibits activity in another, and the tenser we become in the matter, the more forcefully the current flows in the wrong channel. In such cases the best thing to do may be to turn to something else

and put the whole matter out of mind. With this clearing away of the mental confusion and distress the automatic process of recall may eventually work as it should. Probably the most important factor in habitual forgetfulness is the ever-present conviction that one is subject to it, a conviction which works subconsciously to withhold what would otherwise naturally come to mind. It should not be allowed to take root, and if it has done so it should be methodically extirpated. Confidence is a much larger factor of memory than many persons suppose.

There are two popular misconceptions about the possibility of training the memory which deserves special notice. The first is that one may develop general efficiency of memory by sheer quantitative memorization, i.e., by learning by heart large amounts of prose or poetry, or historical or statistical fact. Many a heroic soul has tried this method, and some have borne witness to its efficacy. The opinion of psychologists, however, is that while the practice may inculcate a useful habit of paying attention to what is read, and thereby facilitate any subsequent effort of the same kind, it is not otherwise of value. There is no "general faculty" of memory which may be abstractly and formally trained. Memory is the recall of particular experiences, and it depends in any case upon the form of the original experience, the natural retentiveness of the individual, and certain complex momentary conditions of the nervous system. Since natural retentiveness is substantially unchangeable one can "improve one's memory" only by cultivating habits of concentrated observa-

tion and systematic learning, a methodical practice of reflective association, and an attitude of assurance which tends to prevent inhibitions from working.

The second popular misapprehension is that of the utility of the "memory system." Various artificial devices, some of them exceedingly ingenious, have been constructed for the purpose of helping to fix facts in mind. Dates are translated into queer or significant words, names are made to suggest fantastic ideas, and the like. A detailed account of them is impracticable here. They all have the character of giving the fact to be remembered some peculiar association, perhaps an utterly absurd one, which impresses the mind by its oddity or appropriateness and so serves as does any associative linkage to facilitate recall. They have some usefulness in dealing with isolated and unrelated facts, partly because of the associative characteristics just mentioned, and partly because they compel the user to pay more attention to the facts than he otherwise would. Persons who take them up with enthusiasm sometimes find them helpful in retaining and recalling disconnected items of experience. But in general, as Professor James has remarked, they impose more additional burden in the way of learning and applying the system than they are worth. The best memory system is an habitual observance of the rules and principles indicated above.

Training in Thinking.—The subject of the training of thinking is one about which it is possible to say comparatively little that is helpful in a practical way. The complexity and subtlety of the thought

process seem almost to place it beyond the reach of applied psychology. Yet thinking is such an exceedingly practical business that here if anywhere psychology ought to be turned to account, and as a matter of fact there are certain phases of the process concerning which something useful may be said.

By thinking we properly mean *a succession of ideas about something*, the solution of a problem the investigation of what is unknown, the removal of an obstacle, and the like. When it is more than a mere current of associative imagery or day-dreaming it starts from some sort of felt difficulty, theoretical or practical, and proceeds along a pathway of ideas and beliefs related to the subject, toward a conclusion which is accepted as a solution of the problem. In this sense one thinks about his day's business, or his next journey, or how to vote, or the origin of life, or the meaning of a religious creed. The elements of the process are concepts, judgments, and inferences,—the selection of appropriate ideas and the extraction of their implications. Sometimes it takes the form of "proof," showing that its conclusions are logically implied by certain general principles; and sometimes it advances by reflective observation to the discovery of a new truth. In its fullest form it always involves the use of *general ideas* which it relates to one another or to objects by *inference*.

Successful thinking depends first, then, upon a *clear understanding of the problem*. To state explicitly what one is trying to do is to take a long step toward accomplishment. In general we do not make our purposes in study sufficiently distinct, partly be-

cause of the difficulty of preliminary analysis, and partly from our over hasty desire to get to the conclusion. Sometimes all that is needed is a clear comprehension of the precise nature of the task; this serves to guide the thought process with unfailing assurance to its end. It is undoubtedly true as a matter of historical fact that much important reflection has proceeded with only a hasty idea of its goal, but it is equally certain that it would have advanced more rapidly if it had more definitely formulated its problem.

In the second place, it is necessary to have *a range of information about the matter in question* sufficient to provide ideas which move toward a conclusion. The best thinkers in any field are those who know most about the subject, usually because they have equipped themselves for dealing with it by long and arduous study. Scientific discoveries are made by scientifically trained men. Business and political problems are solved by those who have the broadest acquaintance with their various aspects. Some years ago, for example, the cause of an especially obscure and baffling group of fatal diseases was brought to light by a medical student who had carefully noted the symptoms of every case which came to his attention in hospital practice. Contemporary problems of economics and statecraft call for much better knowledge of facts and principles than is possessed by those in power. No one can become a thinker without painstaking study of the facts upon which reliable ideas may be based.

But this in itself is insufficient. The mere learner

is not a thinker. A further condition is requisite, namely *a natural fertility of association,* i.e., the kind of mind which automatically supplies ideas bearing upon the problem. This fertility in ideas is an individual gift, and in its highest form clear genius. It is facilitated by interest, concentration, freedom from external disturbance, and the importance of the matter in hand. In the last analysis, however, it is a peculiar mental ability possessed by different persons in widely different degrees.

Fourth, one may acquire proficiency in thinking by developing *an habitual attitude of thoughtfulness,* always trying to look at all sides of a question, avoiding prejudice, controlling the sway of emotion, recognizing popular bias as such, and deliberately testing the conclusions of individual and public opinion. Ordinary thought is beset by natural and easy mistakes or "fallacies." How common is the error of "hasty generalization," or that of ignoring pertinent details of a subject under discussion! And how uncommon is the practice of inquiring whether an opposing view does not possess some truth! Sound thinking consists in carefully keeping clear of uncritical assumptions, of partial and emotionally one-sided views,—a habit of mind which may be deliberately cultivated. There is of course a danger in this habit, namely that one will never quite get to the point of action, that decision will always be inhibited by some opposing thought. Hamlet, it will be remembered, discovered this to his sorrow. But it is not a grave danger for most human beings, who usually act too much upon impulse.

Since thinking has evolved mainly for the purpose of satisfying the needs of daily life, we may suppose that *training in thinking may be obtained in the activities of everyday work and play,* in so far as these contain difficulties which may be met rationally. To organize school work in this problem-solving fashion is an important task of education. Some measure of reflective analysis and deliberate experiment is often within the range of the child mind, especially under skilful guidance and suggestion. Doubtless the whole curriculum in school and college could be made to turn upon problems and rational projects more than it does at present. Perhaps if this were done there would be less "cranky" thinking among older people. Is the ideal of a rationally guided life the privilege of a few fortunate persons blessed by nature with the ability to think? Is it not rather an ideal of general education?

There are four special forms of thought which are noteworthy because of their fundamental character and the possibility of developing them by practice. The first of these is *illustration,* the grasp of the meaning of abstract ideas by finding concrete examples. The conceptions which we meet in our reading, or in lectures and discussions, remain mere words in so far as they are novel unless we reduce them to terms of actual things and relations. Thus, to take one of the ideas in this chapter, "motor activity as an aid to learning" is likely to strike us as a somewhat hazy formula until we reflect that it includes such practices as writing, drawing, laboratory demonstration, and the like, practices with which

the student is familiar. The repeated direction "Give illustrations" in our lists of questions and exercises owes its perhaps tedious frequency to this principle.

A second useful form of thought is *evaluation,* or the critical ascertaining of the truth of falsity of an assertion. In all controversial matters, of course, thinking tends to take this form. It consists in relating the idea in question to actual experience or to other ideas which are assumed to be true. One evaluates the idea of evolution, for example, by finding how it agrees or disagrees with certain presuppositions. The current dispute about this subject is due to the fact that one party takes as its standard of truth value some theological ideas which are assumed to be divinely revealed, whereas the other party ignores these ideas in favor of propositions derived from the empirical study of nature. Similarly our evaluation of the theories of Freudian psychology depends upon their relation to our early teaching, personal experience, and acquaintance with scientific psychology. In the last analysis evaluation implies the satisfaction of one's mind, intellectually or practically, in one way or another.

Third, thinking takes the form of *explanation,* or more particularly the search for causes and the reference of facts to general principles or to laws of nature. This process we considered at length in an early chapter. It is so essential to science that some authorities have regarded it as the most important kind of education, and have maintained that the instruction of childhood and youth ought to be directed

mainly at the development of explanatory power. In business and professional affairs such knowledge is often the prerequisite to correct action. Thus, to mention a single illustration, the teacher must ascertain whether a child's apparent stupidity is due to voluntary neglect of study, or to defective hearing, or to adenoids, before deciding whether to prescribe punishment, or a change of seating, or a surgical operation. In daily life, too, we frequently need to know the causes of an unpleasant occurrence before we can proceed to remedy it—a smoking furnace, for example.

Lastly there is the opposite mental process of forecasting effects. Perhaps the term *"prognostication"* best indicates this type of thinking. Its obvious usefulness is that it helps us to avoid mistakes of belief and action. Human impulsiveness is such that our daily life rushes on without any considerable calculation of what is to follow our words and deeds. It is commonplace of political science that the unforeseen consequences of legislation are often quite as important as those which constituted the lawmakers' aims. Yet most of these consequences could have been predicted by reflective thought. In less weighty matters of personal life, also, the cultivated habit of looking ahead dispassionately would save us a good deal of later sorrow. The practical rule which many of us need to follow is that of pausing, when we feel a qualm of doubt about a proposed course of action, and considering with as much coolness as possible what will probably be its results.

Logical inference, formal reasoning and proof are a special kind of thinking. Their importance as instruments of truth and our frequent failure to use them correctly raise the question whether a logical habit of mind may be produced by special training. The abstractly rational subjects, mathematics and formal logic, are the ones which are supposed to be most useful in this respect, and many schools and colleges include them among their curricular requirements on this principle. The weight of expert psychological opinion is that there is not much truth in this view. No great amount of general training, that is to say special training which has general application, is obtained from these studies or from any others. There is no general faculty of thinking or reasoning, any more than there is a general faculty of memory irrespective of its content. Thinking is always essentially related to the particular kind of subject matter with which it deals. One learns to reason skilfully in any field by actual practice in solving problems in that field, and in no other way. Conscientious study of mathematics and logic may develop certain rational attitudes and habits of mind, but these may be developed equally by other studies if they are pursued in a rational manner. As a matter of fact logicians and mathematicians are not in general the best guides in solving the complex problems of human life. The most skilful thinker is the one who has the most detailed knowledge of the subject before him, the best natural gifts of ability to perceive obscure but important relationships, training in solving rational problems of a similar sort,

and "judiciousness," i.e., a cautious, critical, but fair-minded disposition.

QUESTIONS AND EXERCISES.

1. State precisely what you understand "improvement of intellectual efficiency" to mean. What are the limits of such improvement?

2. What external conditions are desirable for concentration of attention? Indicate some actual situations in which neglect of these conditions interferes with efficiency.

3. State carefully the relation of "distractions" to attention. What practical rules should the student follow with regard to distractions?

4. Why is muscular activity of some sort a help in giving attention? What kinds of activity are especially useful in college work?

5. What is the general relation of fatigue to attention? Distinguish between real and false fatigue.

6. What kinds of interest are especially conducive to attention? How may one help himself to take an interest in his work?

7. State briefly the principal conditions of efficient memorization.

8. Explain the assertion that retention depends in part upon interest and purpose. Use illustrations.

9. What is "distribution" of study, and why is it important? How does the proper distribution vary in different subjects?

10. Why is it better to study material in large units rather than in small ones? What qualifications of this principle can you mention?

11. What is "logical learning"? What kinds of relationship are important to note in studying language, literature, history, and science?

12. Show how motor activity helps in studying retentively. Compare its effectiveness in this respect with its facilitation of attention.

13. How do the principles of efficient learning bear upon the subject of "reviews" in study? Upon "cramming" for examination? Upon regularity of study hours?

14. Show how these principles apply to the tasks of learning (a) names of persons and historical dates, (b) preparing for a verbatim declamation, (c) reading a magazine article related to one of your studies.

15. Why are we sometimes unable to recall what we know? Show the importance of subconscious attitudes in this respect.

16. What practical rules can you state for facilitating the recall of material which does not spontaneously come to mind?

17. To what extent does the practice of learning large amounts of poetry or other material train the memory?

18. What are "memory systems"? What value do they have?

19. What are the principal conditions of correct thinking?

20. Name some of the principal types of relation which characterize the thinking process. Try to find illustrations of these thought relations in your own experience.

21. To what extent is it possible to give general training in thinking correctly?

22. Indicate some of the common defects which characterize ordinary thinking about political or religious subjects.

CHAPTER IX

CONTROL OF EMOTION

Emotional Traits; the Problem of Control.—The educational problems of regulating emotion are quite as genuine as those of improving intellectual efficiency. How thoroughly life is pervaded with feeling, and how tragically it may be overcome by inner storm and stress, it takes no very profound reflection to see. The simple pleasantness and unpleasantness of experience, the various forms of emotion, and the more permanent traits called mood, sentiment, and temperament, make a pattern upon the surface of life like the sunshine and shadow in a landscape. Joy and sorrow, love and hatred, courage and fear, hope and despair, anger, envy, jealousy, pride and shame, remorse, sympathy, pity, curiosity, admiration, awe, reverence,—these and many other emotions are among the most frequent incidents of daily life. Some are so subtle and transitory as to elude observation, others are tumultuous and powerful. They are not merely superficial modifications of consciousness; in different degrees of mildness or passion they constitute deep characteristics of our inmost selves.

Their function in life is twofold. First and foremost they are a means of adjusting the organism to

its environment, a source of energy and a means of protection. Some of them, as love, ambition, curiosity, and anger are the major motives of human affairs. Many seem to be the conscious aspect of those instinctive tendencies toward self-preservation and the development of family and social life which are fundamental conditions of the existence of the race. No mere accidents are they, but rather essential parts of the evolutionary mechanism by which nature has carried out its mysterious purposes in the domain of living creatures. Secondly it is by means of them that we appreciate the *value* of experience. Imagine life devoid of all flush and thrill and pang, reduced to a dead level of cognitive process, without joyful anticipation or sorrowful retrospect, without esthetic pleasure or devotional elevation, how worthless and unearthly such hours and days would be! All the glow and charm of human existence have their source in the emotion. Family and social relations, art and religion have their esthetic as well as their biological significance.

Obviously the proper regulation of so vital an endowment is a matter of prime importance. One's emotional equipment may be a blessing or a curse. One's emotional habit may be a perfection of nature or "a perfect nuisance." There are excesses and deficiencies of emotion which we need to reduce or to expand to their proper proportions. Energy may be wasted by anger, life deadened by lack of faith. Especially important is the question of control when the emotion is social, i.e., when many persons are concurrently affected in the same way. The blind

passion of a mob bent on destruction or death is one of the most terrible things we know. Religious excitement and patriotic enthusiasm sometimes call for restraint. The stimulation and checking of social emotion is a considerable part of the art of the clergyman, the political leader, the teacher, the superintendent of a factory, and others who deal professionally with groups of people.

At the outset, however, we find ourselves confronting the perplexing fact that the emotions are essentially *automatic.* They come and go in ways of their own according to biological and psychological laws which have their origin in the evolution of the race. The stimuli of experience touch off responses of anger, or fear, or curiosity, or love, as the flame of a match touches off the discharge of an explosive. Only partially are they susceptible of direct rational control. Generally speaking you cannot argue yourself or others into or out of a state of hope or pity or remorse. Nor do they usually yield to command of the will. We cannot peremptorily order sympathy or shame or despair to appear on the stage of actual life, or to withdraw from it. For the most part it would seem that we are helpless under the sway of emotional forces which are born in us. And the same is true of the phenomena of social experience. Here, too, emotion is automatic; its waves rush tumultuously wherever the forces of nature direct. Only to a slight extent does it come or go in response to argument or command. The larger the group affected, the more reckless and defiant it is. Not one man in a thousand can control a political

convention, a revival congregation, or a lynching mob, and that one does so less by reasoning or mere assertion of authority than by subtle personal forces which almost defy analysis.

Nevertheless the problem of control confronts us. To put it in concrete form, is there some way of avoiding discouragement, of suppressing anger, of transforming worry, of assuaging grief? Can we use our psychological knowledge to increase hopefulness, to produce sympathy, to create ambition? If reason and authority are inadequate to regulate the emotional mechanism is there some other method of accomplishing this? The answer to such questions depends upon a more precise understanding of the **Psychophysiological Characteristics of Emotion.** —Our starting point is the fact that emotion involves certain bodily conditions. Underlying it are various organic processes, not only those of the brain and nervous system, but also the more distinctly perceptible activities of voluntary and involuntary muscles, of blood vessels and glands. The emotional stimulus, something perceived or thought of, produces directly a bodily reaction, a large part of which consists of changes of respiration, heart beat, supply of blood to different organs, erection of hair, secretion of tears, clenching the fists, gritting the teeth, "cold shivers," trembling at the knees, a stammering tongue, and many other less conspicuous performances. These are brought about by the action of the autonomic nervous system, upon which the stimulus appears to act more or less directly. Sometimes, as in the case of fear, we feel the emotion

before we intellectually perceive the character of the object which produces it. A loud noise, a strange movement, a clammy pressure, a sudden rustle in the grass at our feet, touch off visceral and muscular operations with swift immediacy. The emotion usually depends in some degree upon conscious associations which the stimulus arouses, but it seems clear in numerous cases that these do not rise above the threshold of awareness. The bodily processes follow directly upon the sensory stimulus. Our consciousness of this "bodily resonance" is a large part of the emotion.

Furthermore the physical basis of emotion is found partly in the movements such as running, striking, singing, and the like, in innumerable gestures by which the emotion is ordinarily said to be "expressed." Apparently these same expressions react through the autonomic nervous system to increase the bodily resonance, so that within certain limits the more we express the emotion the more we feel it. Flight increases fear, obeisance tends to produce humility, weeping deepens sorrow, laughter enhances joy, and so on. This reverberation intensifies or modifies the outward expression, which again reacts to reproduce the internal symptoms. The whole process continues until the stimulus is removed or until an appropriate bodily readjustment takes place. The joyful moment comes to an end, flight leads to safety or exhaustion, surprise gives way to comprehension, religious fervor softens to an enduring calm.

Emotion is a complex combination of the percep-

tions or ideas aroused by the stimulus, the mass of sensations resulting from the bodily changes, and the pleasant or unpleasant tone of the whole mental content. Apparently the sensory constituents are much the same for different emotions within certain groups, but differ among the groups according to the organs and activities involved. Thus the marginal awareness of accelerated breathing, and of palpitation of the heart are features of a wide variety. In general, quiet and smooth running bodily activities correspond to the calmer, more pleasant emotions, while violence and tension characterize the physiological basis of the coarser and less agreeable forms.[1] Particular emotions have different degrees of intensity, forms of expression, and peculiar ideational elements related to the object of the emotion. The bodily resonance is normally marginal, and the whole state of consciousness is relatively vague and confused as contrasted with the more distinctly intellectual states. The effect is to increase or diminish activity according to the needs of the organism. Nature has bred such reactions in her creatures, partly because they make for life—in other words our emotions, generally speaking, are good for us—and partly because of their intrinsic worth. The whole process, as we noted above, is automatic; it exhibits the mechanical character of the psychophysical organism. Our problem is, How can this mechanism be controlled?

[1] Recent physiological investigation has brought to light the details of glandular function which underlie fear, anger, and other emotions. This knowledge reënforces psychological theory. It appears also that persistent excess or deficiency of secretion in certain glands affects one's whole emotional outlook on life.

Evidently the points at which control must be exercised are the *stimulus* and the *muscular expression.* Upon these depends the internal part of the process, which is perfectly mechanical and cannot be directly manipulated, but which constitutes the basic emotional stir. We can therefore solve the problem of emotional regulation to some extent (1) by changing the stimulus, removing or modifying it, or replacing it by another, and (2) by behaving in the way which corresponds to the emotion which we want to produce, or refraining from behaving in the way which expresses the undesirable emotion. To a considerable extent both methods are possible, and both tend automatically to produce or to suppress emotional consciousness. In so far as we can skilfully press the mental button of voluntary control at either point, the mechanism of nature will do the rest.

Control through Change of Stimulus.—This is the ordinary procedure. In its simpler forms it consists merely of removing the stimulus or substituting another for it. In a more subtle and interesting way the process takes place by modifying the associations and ideas connected with the object. Thus fear is dispelled by seeing that there is no danger, and laughter dies when we observe that the victim is really hurt. A bold front and steady advance lessen the dog's angry suspicion of an intruder. Self-respect is gained by improvement in dress and steady work. Resentment is softened by reasoning or reflection which prove that a fancied affront was unintentional. Desire fades if its object is shown to be

worthless; while on the other hand a repulsive thing may become scientifically fascinating. A new social environment changes repugnance toward art or religion to approval. All this, of course, is perfectly familiar everyday psychology of a non-scientific but nevertheless reliable kind. Its practical rules hardly need statement. We control emotion in ourselves and in others by removing or changing its cause, looking at it in a new light, seeing it in new relations. Doubtless the tumultuous emotions of childhood need this sort of educational treatment more frequently and impressively than they usually receive it.

Several of the special forms of operation of this principle deserve notice. Perhaps the simplest is that of paying attention exclusively to the pleasanter features of a situation, or to the agreeable things in life, ignoring those which are unpleasant. It hardly need be said that this is a somewhat dangerous rule to follow, and it may become exceedingly immoral; for example in the cultivation of indifference to the suffering of others; but if it is practised in the way of habitually picking out the brighter instead of the darker aspects of our own experience, and disregarding only those evils which we honestly cannot help, it may be accepted as a healthy prescription. To a considerable extent our lifelong happiness depends upon our ability to exercise selective attention in this simple way.

In further application of the same principle we may turn attention to the emotion itself instead of to its object. Introspective scrutiny of anger, van-

ity, or jealousy is killing in its effect. For the same reason observing the imitation of our emotion by another tends to check it, or to replace it with anger or shame. The organic constituents of the emotional state are marginal, and lose their intensity when brought into the focus of consciousness. Physiologically the immediate result is that of starting counter processes which suppress the original bodily stir.

Various lines of systematic reflection upon the cause of emotion serve our purpose, none more helpfully than that of considering the *necessity* of the trouble. Fortunate are the few who are able to present all things to themselves in a rational fashion, seeing them as parts of nature, working according to nature's laws, and so avoiding the fear, anger, and sorrow which overwhelm the rebellious soul. To do this has been the ideal of the "wise man" of every age, and the principle has assumed philosophic dignity in ancient Stoicism and the ethical doctrine of Spinoza. When the evil is seen to be the unavoidable result of natural causes our attitude toward it automatically changes. A professional physiologist whose brother had died from appendicitis once said to the writer, "I was present at the autopsy, and when I saw the condition of his appendix I knew that he couldn't have lived. No one could in that condition. The very necessity of the end somehow made it easier for me to bear." Similarly our resentment at the misconduct of others yields to a reflective consideration of the reasons for it, or the necessity of it in their character. Scientific study of

the deadly agencies of diseases such as yellow fever and tuberculosis makes no room for terror in the mind of the investigator. "Dispassionate" persons are those who habitually see events in the light of cause and effect, a habit possible of cultivation by anybody, and exceedingly worth cultivating as a method of contentment.

With this line of reflection naturally go certain others which increase its effectiveness, for example the knowledge that sorrow is a universal affliction of mankind. The reader will recall the Buddha legend of how the sage comforted a mother, mourning over the death of her child, by sending her in search of a magical restorative which could be obtained only in a house unvisited by death. She found, not the object of her search, but consolation. Distress likewise is subdued by a contemplation of the ultimate good, of which it is an incident, or which is produced through its agency. Horror of war and revolution, of famine and pestilence, is mitigated in some slight measure by observing good purposes which they subserve or desirable consequences which they entail. Perhaps we should also note in this connection the practice of Christian Science of denying the "reality" of evil and so escaping its emotional effect. And finally we have the interesting phenomenon of the relief of a "suppressed complex." Some painful experience, some bitter memory or hopeless desire, has been deliberately excluded from consciousness, with the result that it continues to work in the depths of the mind like a festering sore, making itself felt in strange and distressing ways. In such cases merely

bringing the concealed trouble to light, so that the patient speaks freely about it, ultimately serves to relieve the emotional tension.

Least efficacious is the effort to produce or dispel an emotion by sheer will, though even this is occasionally possible. Ridicule, as we all know, may be employed with success now and then, by turning the attention of the person from the object to himself and so creating a new emotional disposition. More important are the methods of surveying the object or situation reflectively, and thereby precipitating a different kind of psychophysical discharge. In all this the fundamental principle is the same: Modifying the stimulus, or the apprehension of the stimulus, results by a natural mechanism in a modification of the emotion. The emotion connected with rationality are relatively calm.

Control through Action.—Even in the procedure just described we not infrequently find ourselves making use of the second principle of control, namely *appropriate action.* As Gulick puts it, "Assume the bodily positions and movements and manners and tones of voice that belong to the emotional state you desire." The muscular expression of an emotion, as we have seen, works backward by currents of energy through the sympathetic nervous system to reënforce the internal bodily processes which we feel as the physical basis of our emotional states. Accordingly we may begin with these muscular performances, forced and artificial though they are, and by them produce a genuine state of feeling. There are limitations to the possibility of doing this, of course,

but the effective range of the principle is greater than may be supposed.

Certain illustrations of the process are perfectly familiar. Running away from danger increases one's fear, whistling is traditionally a source of courage, sadness is relieved by cheerful smile and speech. Checking an angry gesture tends to diminish the anger, as does the adoption of a calm manner and low voice. In general the natural expressions of the untroubled mind have the effect of subduing, as their opposites do of intensifying, the mental turmoil.

Let us observe some further illustrations, of a less familiar sort. Chronic discouragement, for instance that of the dull school child, needs a systematic prescription of easy tasks. Finding that he can *do* something the youngster gathers confidence and presses on to fresh conquests. And the same truth applies in some measure to all of us. The "habit of success" is two thirds self-confidence engendered by successful accomplishment. Irritability and anger may be worked off by monotonous forms of behavior. In fact they yield ultimately to the simple action of walking; the steady tramp, mile after mile, so alters the internal activity as to smooth out the emotion. The frequent curse of worry and nervous uncertainty may be dispelled likewise. Those who are given to forecasting trouble, anticipating accidents, imagining disagreeable interviews, and the like, while their nerves and muscles conspire to make them tensely unhappy, need to follow the practical rule of action. We are less inclined to worry over a troublesome matter if we are actually

doing something about it—not, of course, random, futile activity, which merely increases the distress, but steady, planful, appropriate performance. Thus the mothers whose sons went to war did wisely by writing cheerful letters, knitting, and sending comforts. The truth that worry incapacitates us for effective accomplishment is no more certain than that it gives way to the hope and cheerfulness which naturally follow upon well aimed deeds.

No better application of our principle can be found than in the case of sorrow, or even in some cases the more poignant emotion of grief. If stricken in this way, then in the name of Heaven and scientific psychology *do something to help somebody.* Not only does such service divert the mind temporarily from the woe; it tends to produce a different and happier bodily tone. Voluntary service is one of nature's best ways of creating happiness, in the server as well as in the served. Human beings have always found joy in helping others. It is not to be denied, of course, that activity of this kind is in a sense artificial. It may even seem lifeless; we "haven't the heart for it." Yet if we grasp the truth of the matter we can deliberately set ourselves at work, persistently keeping our mind upon the task, and thereby controlling the emotional mechanism.

Those who are acquainted with the practices and the literature of New Thought and Christian Science know that the faithful find comfort and reassurance in reading aloud the doctrines and discourses of their religious belief. Many passages in the Bible, for example the twenty-third psalm, have the same pe-

culiar value. Speech is a form of action, carrying with it various emotional effects. Calm and measured utterance may be used "autosuggestively" to produce a peaceful state of mind. Many a fear and worry which torment us persistently in spite of our wish to escape them may be exorcized by simply repeating with the language and tone of assurance the substance of a rational hope.

Let us not suppose that the efficacy of the practice lies simply in its distraction of attention from the object of the undesired emotion. This is very helpful, no doubt, but it is only a part of the process. The important fact for our practical consideration here is that the basic stir and sway of emotion is determined in part by the action which is said to express it. The physical movement starts currents of energy which spread through the sympathetic nervous system and thereby stimulate activity in the heart, lungs, glands, and other organs. These activities report themselves in consciousness, vaguely but intensely, as an emotional condition. Though the emotion itself as a conscious state is not directly obedient to the will, the muscular mechanism which indirectly produces it is under our control. Rational practice in the matter accomplishes wonders.

Of course our two principles properly work together. Emotion is regulated by surveying its cause or object in the right light and then acting accordingly. Such a practice, no matter how difficult at first, tends to become habitual, and gradually determines one's character. It does not necessarily

signify the emotionlessness or "apathy" of the Stoic; rather does it serve to intensify the emotions which are desirable. Those who impress us by their calm dignity and unfailing command of life are those who are accustomed to think and act in this way.

Control of Emotion in Social Groups.—Most interesting and important illustrations of our principles are found in the behavior of groups, crowds, and society at large. For emotion, it hardly needs to be said, is a social as well as an individual fact; indeed, some of its most striking phenomena are distinctly inclusive of large or small groups. It is sympathetically communicated from person to person, it runs in waves over audiences, it unites religious congregations in song and prayer, it is the binding cement of crowd, party, class and caste. By the natural mechanism of suggestion and imitation and by various educational practices it spreads through multitudes, tending to eliminate individual differences and reduce all to the same level of feeling. The joyful earnestness and tumult of a football game, the deadly enthusiasm of an infantry charge, the fury of a mob bent upon lynching its victim, the fervor of a religious "revival," the cultivated esthetic rapture of a symphony audience, the antagonism of political partisanship, the hatred of a nation for its historic foe,—these are only a few of the more or less familiar exhibitions of group emotion.

The control of these vast and often terrible forces is evidently an art of the very first importance. In general it operates by precisely the same laws as have already been indicated. Emotion is roused or modi-

fied by a perceptual or ideational stimulus, such as the words of a speaker, the waving of a flag, or the elevation of the crucifix. It is reënforced by action, and it possesses intensity proportional to the number who are affected in the same way and who communicate their state of mind by example and imitation. Common action is the secret both of its tremendous power and of many a remarkable performance of social leadership. Those gifted persons who can create or take advantage of conditions, so that by skilful stimulation the group acts in the same way throughout, are able to exercise control over its emotions.

One of the most familiar illustrations is that of consolidating an audience by cracking a joke. The focussing of attention upon the speaker and the preliminary "set" of humorous expectancy pass into a wave of laughter which is often more than half imitative, but which serves the purpose of producing a receptive and sympathetic good humor. A crowd, in the nature of the case, permits little or no individual movement, and when it has been unified by a laugh it becomes the more plastic and suggestible to further emotional stimulation. Singing has the same function. The procedure of the evangelist who induces thousands to "hit the trail" is a perfect example of the thing of which we speak. Usually a chorister begins by consolidating the assemblage with revival songs whose easy lilt irresistibly takes possession of all. Almost everybody sings or tries to, and the common activity, together with the unified attention and the physical restraint of the close

packed throng, constitute favorable conditions for the evangelistic art. The sermon is an appeal to the emotions of humility and aspiration, of fear and shame and hope, and at its conclusion the speaker, by skilfully causing a few persons to rise and come forward to the altar, starts an imitative movement which is sometimes of large proportions. The conscious side of the process is a certain kind of religious feeling. In a less conspicuous way the common forms of worship in any religious service have a similar result. In dealing with old and young the effective method of producing religious emotion is that of inducing them to *act religiously.*

During the war the sentiment of patriotism was propagated in this active way. There were meetings, parades, bond purchases, war charities, the various activities of the Red Cross,—action, action, action, not merely for the specific result of enlistment or contribution, but for the effect upon the national mind, the deepening of allegiance to the nation and the government. Those who seemed insufficiently patriotic were put under pressure to do as others did, compelled by moral influence and sometimes by physical force to march, to subscribe, to pledge allegiance, and so on. On the whole the method worked successfully in a temporary way, though whether a sound and healthy patriotism can be obtained by compulsion is as doubtful as is the corresponding question with regard to religion. Where there is a strong disinclination to the activity, or an antagonistic sentiment, compulsion is likely to fail. Merely going through the movements in submission to force

does not overcome the hostile associations within the mind. Still less did the disgraceful persecution of sincere but misguided pacifists alter their emotional antagonism to war. They had seen the horror of it too clearly, according to their lights.

But whatever the ethics of the method, or its dubious effectiveness in individual cases, in general there can be no question that socially propagated action produces profound and pervasive emotional results. Group conditions call into operation the automatic processes which underlie our common enthusiasms and aspirations, our passions and hatreds, our patriotism, and our religion.

Repression of Emotion.—According to Freudian theory there is grave danger in repressing emotion. For emotion is the mental aspect and expression of instinct, so fundamental in character that it cannot be absolutely inhibited. If repressed, it tends to break out in some other form usually more harmful than the natural discharge. Thus strong impulses of fear, anger, ambition, and love, if persistently "squelched," produce a wide variety of neurotic symptoms such as hallucinations, muscular automatisms, moral perversions, and other afflictions. In severe cases these constitute the "psychoneuroses" or pathological disorders of the mind. "Psychoanalysis," as we shall later see, is the interpretation of such symptoms as revealing a repressed emotional tangle.

The proper treatment of emotion, therefore, is said to be that of letting it alone, or if it is seriously objectionable, giving it some safe channel of discharge

—"side-tracking" it, as we may say, in some harmless outlet. Best of all, when possible, is the "sublimation" of it by finding some ideal form of activity, such as art, philanthropic service, or even play, which suffices to carry off the tumultuous energy. In this respect psychoanalytic procedure follows what has always been the method of the wise in dealing with powerful emotion.

As we have already observed, Freudianism holds that the early experiences of the child are exceedingly effective in determining its later mental development, and this applies to emotional as well as to intellectual experience. It is desirable, therefore, according to the theory, to avoid repression of childish emotion, since otherwise nature will avenge itself by persistent tension and perhaps some sort of perversion of nervous impulse. When a strong emotion bursts forth it is best to let it take its natural form of discharge, confident that the passing of the storm will clear the mental atmosphere. It is desirable also to refrain from treating a child in such a way as to exaggerate its emotion, for instance to terrify or needlessly exasperate it, for the sense of helplessness thus lodged in the "unconscious mind" will seek relief by queer, neurotic forms of self-defensive behavior. Especially important is the avoidance of over-stimulating sex emotion by excessive caressing, or in other ways, since this leads in later life to emotional conditions which will inevitably suffer repression, with consequent danger of incurring some abnormal twist.

The foregoing theory bases itself on a conception

of the "unconscious mind" which we have seen to be dubious, but this basis is not essential, since the theory is compatible with a scientific concept of subconsciousness as constituted by neural, marginal, and dissociated processes. It goes to astonishing lengths in its detailed statement of the effects of emotional repression in childhood, and of emotional over-stimulation as the cause of lifelong difficulty or tragic mishap. Much of this doctrine is so obviously guesswork that we may ignore it. Furthermore, the recommendation of its extreme advocates that one should refrain altogether from interfering with the emotions is impossible of acceptance. Both in children and in older persons any such practice would produce an intolerable social chaos. Society can better endure the presence of a considerable number of cases of mental disorder than the consequences of an utter lack of discipline. On the other hand the theory undoubtedly contains important elements of truth, which perhaps have been too much neglected. The emotional life of children frequently deserves more intelligent and sympathetic treatment than it receives. In adults, too, powerful emotion needs an outlet, either the natural one, as for example in the first expression of grief by tears, or in some appropriate form of activity which will relieve the nervous tension.

QUESTIONS AND EXERCISES.

1. Name as many emotions as you can. What are the general functions of emotion in life?

2. What emotions are most in need of control? Why is direct control by the will difficult?

3. What organic processes accompany emotion? Correlate them with different emotions.

4. Show how muscular action is related to emotion.

5. State the general principles of control of emotion. Explain the assertion that control works automatically.

6. In what different ways may the perception of the object or stimulus be modified so as to produce a change in the emotion?

7. Show how selective attention may operate to produce general happiness in life. To what extent is this justifiable?

8. Show by illustration that some emotions may be altered by turning attention to the emotion or to the self as possessed by it.

9. What is meant by "taking a philosophical view" of troubles? How does religious faith view them?

10. Show briefly how a new view of the object may alter the emotions of fear, anger, envy, jealousy, vanity, and ridicule.

11. Show how the principle of control of emotion by muscular activity may be applied in restraint of fear, anger, jealousy, contempt, and despair.

12. Show how it may be applied to produce self-confidence, self-respect, sympathy, and patriotism.

13. Describe the operation of this principle in the field of religion.

14. Show the relation of these principles to the problem of lessening international enmity.

15. Explain clearly in psychological terms why public speakers make use of humorous stories.

16. What is the Freudian theory of the danger of repressing emotion?

17. What sort of treatment of emotion does the theory recommend?

18. Show how this theory applies especially to childhood. How would you criticize it?

CHAPTER X

WILL POWER

Volitional Traits; Practical Problems of the Will.—The term "will" includes various kinds of mental and physical action in which the agent is conscious of an aim, and of effort to realize it. Wish, impulse, desire, decision, determination, resolution, initiative, patience, persistence, perseverance, endurance, self-assertion, self-denial, obstinacy, vacillation, these are some of the experiences and traits of character comprehended by the term. We may conveniently distinguish between the *resolution* type, the *initiative* type, and the *perseverance* type of volition. In the first case the will acts by making a decision for the future, more or less distant. In the second there is an actual beginning of the operation, though this may or may not be continued. In the third the will steadily pursues its way in the face of obstacles, and refuses to discontinue effort. Many persons are characterized by the accentuation of one or another of these kinds of will—the habitual maker of good resolutions, the practical man of strong initiative, and the dogged, persistent plodder.

The difficulty with which we are mainly concerned in this chapter is the common experience of inadequate accomplishment of our purposes. Generally

speaking we have to acknowledge ourselves inefficient in point of effective or sustained attack. Our desires and resolutions do not pass into persistent activity. Even when our aims are clear enough and when tasks are spread out before us we nevertheless come to the end of the day with the uncomfortable realization that in this or that matter we didn't quite rise to the point of action, or if we did we failed to carry it through with the energy which was needed. The total accomplishment was less than it should have been, less than our powers properly demanded. The impatient query rises to our lips, "Why don't I get more *done?*"

The difficulty is the more serious because in the higher grades of work, those which are held in greater respect and bring greater compensation, the worker is largely left to his own devices. Initiative, self-direction, independent performance which involves an intelligent grasp of situations without explicit commands, characterize the occupations toward which educated and ambitious persons aim. In this sort of work taskmasters are lacking. No boss is constantly at hand to tell what to do next, to prod or restrain or rebuke. One is his own master, and he is judged by the ultimate measure of his accomplishment, when it is too late to speed up or make amends. Hence the consequent penalty of inefficiency is correspondingly great. If he proves himself a failure he slides permanently into an obscure corner.

It is not hard to distinguish among our acquaintances along this line. Some are models of steady, persistent performance; others are "weak willed," im-

pulsive or vacillating, given to making good resolutions without sticking to them. High purpose is succeeded by dawdling that never arrives anywhere. The difference between the types is not one of intellectual power. A brilliant intellect may be the most pathetic illustration of inefficiency, while a lesser mental endowment forges steadily ahead. The successful sort, the "able executive," is that which makes prompt decisions with reasonable intelligence, and proceeds to carry them out. No questions about you are practically more important than "Can you actually take hold?" and "Can you endure?" On the answers to these questions, as they are frankly or tacitly asked of everybody, depends the world's great work.

Accordingly the practical problems of the will which we have to consider are, how to make resolutions which stand a fair chance of being carried out, how to undertake tasks efficiently, how to stick to them, how to overcome tendencies to procrastination and vacillation. In attempting to answer these questions we begin with a brief analysis of the will.

Factors of the Will.—The student of psychology knows that voluntary action is not a simple matter—no mere stroke of mental energy or push of the soul. Rather is it a complex of factors varying in intensity and importance. The first is the *idea factor* or *aim*. Volition always involves a more or less clear anticipation of the thing to be done. Strictly speaking there is no utterly "blind" will. The aim may possess much or little clearness; it may be no more than a vague sense of direction, or a faint kinesthetic

image anticipatory of the deed; or it may be a highly reflective plan of action with all the detail which this involves. Usually a fragmentary idea of the ultimate goal, or of some feature of it, is sufficient to touch off all the intermediate springs of action, as when the intention of mailing a letter leads us automatically to pick it up, rise from our chair, and start for the post box. Many of our voluntary performances show surprisingly scrappy conscious instigation; their actuating purposes lie at a deeper level of the mind. But when the action is of an unfamiliar sort the details have to be presented distinctly, and in particular the ideas of the physical movements play a larger part. In these instances the will operates by anticipating clearly just what to do next. In every case power of will must be thought of as relative to an end or purpose more or less explicitly held in consciousness.

Secondly, there is a *suppression of opposing tendencies.* It is not enough merely to have an idea in mind; even then, as we know from abundant experience, the deed does not always follow. Something seems to stand in the way, so that we do not quite get to the point of action. This something may be a particular doubt or difficulty, some unattractive feature or aspect of the proposal; or it may be a deep and inscrutable reluctance which roots in the depths of character. Subconscious fears and repugnances may keep us from doing what we desire to do. Or again, it may be nothing more than mere laziness, an habitual or constitutional inertia which constantly retards action. But whatever it is, it must be over-

come before the act can take place. Physiologically, the general disposition or "set" of the brain, in so far as it is inconsistent with the proposed act, has to be put out of gear. The opposing tendencies of the nervous mechanism must be suppressed if volition is to be complete.

This suppression takes place in various ways. To a great extent it works automatically, below the threshold of explicit consciousness. The inhibitory tendencies may be weak and short lived. Force of purpose suddenly or gradually overpowers their resistance, and lo, the action is begun! If they appear as conscious difficulties or objections the mere *turning of the attention away from them* sometimes results in their decease. Many a "strong will" is hardly more than a habit of steady fixation upon the goal of desire, and an unyielding refusal to let the opposing ideas enter the mind. When, however, these make themselves felt persistently, *thinking* serves to put them in their right place. Their real weight is brought to light, and if it is relatively slight they are excluded from the scene of action. Reflection about the aim, an enhanced realization of its importance and depreciation of opposing factors, clear the path and start the movement. The facility with which the suppression takes place depends mostly upon *habit*. The will is determined to a large extent if not completely by established likes and dislikes, habitual valuations which automatically or rationally control its course, reënforcing its aims and checking inhibitions. Many of these determining tendencies may be distinctly recognized as the product of

past decisions. Every volition signifies for the future that the inner opposition to that sort of action is permanently weakened; choice makes similar choice easier, and the failure to carry out a purpose notoriously presages later failure likewise. According to neurological theory, resistance to currents of nerve energy at the synapses, i.e., the points of connection between neurones, is lessened by actual transmission, so that the consideration of the pros and cons of a project parallels the complicated process in the brain which expresses past experience. The suppression is also facilitated by *imitation*. We accept ideas more easily when we see that others have accepted them. Objections fade away in the light of common purpose, and opposing tendencies are stifled by social pressure. A notable example serves to clinch one's determination, as the pope, in Browning's great poem was enabled to make his momentous decision by consulting the history of one of his eminent predecessors. An illustration of the whole process is found in the experience of resolutely engaging in an unpleasant but important task when there are enticements to desert it. If we keep our attention upon it and consider its ultimate value we suppress the opposition, and the principle of ideo-motor action does the rest. In so far as the practice is habitual or imitative it tends to become easy and even agreeable.

Is there a further factor in the exercise of the will? A dignified psychological tradition holds that there is, at least in certain cases, a peculiar consciousness of will-power as such, an immediate feeling of the

flow of volitional energy, a sense of inner effort which is the very essence of the matter. By this essential force the self is supposed to decide between conflicting purposes and to pursue its way against opposition. Most psychologists, however, maintain that the alleged will-consciousness is nothing but a complex of sensations arising from muscular strain. The conflict between the aim and the inhibitions, or between opposing aims or sets of motives, reveals itself in muscular tension in the wrinkled forehead, the labored breathing, and incipient movements of various muscle groups, the conscious resultant of which is a sense of *doing*. The real will-power in the case is the working of one's character in the mental process, of which the muscular strain is merely an expressive or accessory feature. No distinctly volitional energy, it is said, is revealed by careful introspection. The point of the controversy leads to ethical and metaphysical questions about the freedom of the will with which we are not concerned. For our purposes it is better to assume as components of the will only the unmistakable facts of introspective analysis, namely, the idea of an end and a more or less complicated inhibitory process, perhaps involving other aims, adjustments among which take place by attention, reflection, habit, and imitation. Let us note the significance of these factors for the practical problems stated at the beginning of this chapter.

The Need of a Plan.—We have observed the primary importance of the guiding idea in volition. For practical purposes this implies that efficiency of

will depends upon having a *plan of action.* Given this, with the requisite measure of detail and freedom from inhibitions, the will automatically expresses itself in the deed. Some of the further implications of this principle are as follows.

In the first place, with regard to the effectiveness of resolutions, the kind which counts is that which deliberately and definitely prepares to meet probable conditions. Instead of saying "I will do this in the future" or "I will never do that again," resolve properly takes the form of deciding that when such and such a situation or temptation appears *"I will meet it in this way."* To say that when I return from my vacation I will pitch in and work hard is less promising than to consider just what tasks will need to be done, what difficulties will have to be overcome, what inducements to slackness and general discouragement will present themselves to be fought and conquered—to consider these items explicitly and to decide how to deal with them. The resolution which plans to carry itself out is thus much more reliable than the common kind. The more explicit and definite in detail it is, the greater are its chances of success. And in the same connection we may add that it is more effective to resolve to *do* than to *be.* The latter is so indefinite that it is likely to fail to meet the actual conditions which arise. It is valuable principally as a reënforcement of a more pointed sort of determination, and also as evidence of accumulated experience of success.

Secondly, we frequently find difficulty in bringing ourselves to the point of actually beginning a task,

and here again the principle of the definite plan has practical significance. It suggests the utility of a daily schedule, with particular things to do at specified times. If we have several duties confronting us simultaneously, it is only too likely that we shall fail to do any of them. They seem to get in each other's way. The pressure of each prevents us from giving ourselves whole-heartedly to any, or we turn in a futile fashion from one to another, dropping each as soon as it is begun. A previous declaration, however, such as that we will begin to answer those letters at half past seven o'clock, or that we will take up a certain matter of business next Thursday at nine, settles it. The proper set of the brain is established, other tendencies are frustrated in advance, and when the time comes we almost automatically do the thing appointed. Those whose occupations leave them largely to their own initiative learn that their salvation depends upon regularly making some sort of day-plan, perhaps before they rise in the morning or while they are dressing, and in this way pointing the will in the right direction with a strong initial shove. Such a plan ought not to be too finely subdivided, but should rather fix times and places for the most important parts of the day's work, leaving the minor ones to be fitted in wherever they are convenient.

Sometimes the difficulty of beginning work is due to the fact that we don't know precisely how to begin. Especially if the task is a novel one the uncertainty results in procrastination. Some persons fortunately have a ready initiative; they seem to

know by a kind of intuition how to plunge into any job, however unaccustomed. But most of us take hold of new work uncertainly, feeling and fumbling our way along. Here, too, a plan is desirable, even though it covers only a few steps, and those experimentally. Thinking about the matter, baffling though it is, brings ideas of how to start, and thereby a path is made for the will. One need not foresee the whole project in detail. It is enough to determine its initial steps and broad outlines. Generally speaking, all human affairs of importance have to be executed with a considerable measure of planning as the work proceeds. To wait for an inspired view of the whole before beginning is a common way of getting nothing done. Better far to do something even if we cannot see a great way ahead, letting the further details develop as we go along. Ideas come more readily under the conditions of actual progress. Mistakes can be rectified.

Not the least virtue of the plan of action, with respect to the will, is that it gives staying power. Each part is a stimulus to continued effort, or perhaps an invitation which cannot be declined. By its very existence as a definite part of the whole project it imposes upon us a conscious obligation to persist, and a sense of failure if we do not. So the work acquires momentum as we proceed; the accumulated accomplishment pushes us along, while the next possible bit beckons us on.[1]

[1] Those blackberry vines along the edge of my orchard, what an obstreperous nuisance they were! Encroaching on the trees, tangling themselves in the foliage, invading my neighbor's property, and pointedly defying attack. So long as I merely resolved to clear them

Decisiveness.—But a guiding idea is not always sufficient for volition. Often we find our will impeded in spite of clear purpose, high resolve, or even shrewdly calculated plan. "The thing that we would we do not." We fail to get down to business, we dawdle or postpone, hesitate or vacillate uncertainly, while time flies. Something within us thwarts the deed. Nervous dispositions in the brain are set like brakes which need to be released before movement can take place. These inhibitions are of various sorts—instinctive pointings in opposite directions, effects of early restraint, vague fear and discouragement, habitual caution and habitual laziness, a mental practice of interminable pondering or of looking at objections and difficulties at the last minute—in fact any idea, emotion, or habit which runs counter to the proposed course. Their effect is to prevent decision diverting or dissipating the energy which ought to go to the point of action. They must somehow be suppressed. Only by letting the aim take undisputed possession of the mind, or by realizing its dominant importance, can it become effective.

The trait of character which we regard as desirable in this respect may be called *decisiveness*. Obviously individuals differ in the possession of it; some apparently exercise it as a native disposition, and go through life with a ready will; others seem

out, they remained untouched. But when I set a day for beginning the job, divided it into sections, decided where to start and what tools to use, what to cut and what to leave, where to burn, and so on, the work was done without great difficulty, and I kept at it until it was finished. It was the definite plan that did it. I suppose everything from writing an essay to conducting a military campaign is best done in the same way.

just as naturally to lack it. It is a dominating characteristic of leaders, the men who plan and execute great works in all fields of practical activity, statesmen, "captains of industry," railroad presidents, military commanders, and the like. These men have the natural or acquired faculty of grasping a situation and reacting to it quickly and firmly. The faculty may or may not be exercised wisely; indeed it may be utterly selfish and ruthless rather than generous and constructive. We are not concerned here with its moral quality, but only with its practical significance and the possibility of acquiring it. Our question is, how to become more ready and firm in decision, how to overcome inhibitions.

Practical psychology follows here the lines already indicated. In many matters decision takes place more or less automatically, by processes which work below the threshold of consciousness, so that all that is needed is time for them to operate. Having got the pros and cons of the question in mind we can safely let the mind's mechanism take care of the matter. Eventually we find ourselves clearly aware of the right course, and decision follows forthwith. Sometimes this comes about simply by dismissing the subject for the night, and "sleeping on it"; sometimes by putting it aside for a few days while we busy ourselves with other things. Sometimes a "change of mood" puts the various considerations in their proper relations and sets the mind at rest. Light perplexities vanish in the shadow of affliction. A difficult course becomes easy when our mental atmosphere is that of seriousness. In matters which

do not demand prompt action this sort of subconscious deliberation and evaluation, leading ultimately to clear decision, may be practically most helpful. Instead of mulling and stewing over a problem in a futile fashion, it is better to consign it temporarily to the limbo of forgetfulness and let it settle itself there. Here, by the way, is the psychological secret of the ease with which the religious mind sometimes triumphs over its troubles. By declaring the evil "unreal," as does Christian Science, or by "casting the burden on the Lord," the tension is relieved and the path becomes clear.

If the inner obstructions do not clear themselves away automatically we may perhaps overcome them and reach a decision simply by voluntary attention. Thus, supposing that we have the case clearly enough in mind, but that no one course appears decisively preferable, a deliberate fixation of attention upon some point of performance, and concurrent refusal to let alternatives take the stage of consciousness, mechanically results in action. The increased vividness or the aim carries with it an intensity of desire which overcomes opposition. Possibly we can "will to attend" when the larger effort of immediate decision seems impossible. Just as a physical mass may be moved more easily if the leverage is applied at the right point, so in mental affairs voluntary effort is facilitated by directing attention at a certain feature. The *point d'appui* for all will-exercise is that of attention; here we find the essence of the matter, in the simpler as well as in the most rationally elaborate volitions. We will only that to which

we momentarily or persistently attend. Hence self-control in this respect is of far-reaching importance. Keeping an object in mind, thinking about it pertinaciously and in detail, refusing to let hostile considerations intrude, turning attention away from them when they appear, this sort of process results automatically in the working of the favored idea. A preliminary decision not to debate the question further but to look only at one side and an accompanying "resolve to will" help likewise. The method may not always be morally satisfactory, but it certainly is effective. It is, by the way, the method naturally followed by persons of strong will.

But suppose that the problem calls for thought, for an evaluation of the different possibilities, an estimate of the desirability of this aim and the weight of that objection. The rational will demands to know what a particular course of action is *worth.* To answer this question requires that we connect the proposal with our concepts of what is really valuable in life, thus bringing to bear upon it the force of our deep instincts and emotions, rationalized by experience. Undoubtedly the greatest achievements, conquests, discoveries, constructions, have been accomplished in the light of what the doer regarded as really worth while—fame, wealth, success, power, knowledge, service, moral laws, divine commands. Their instincts of self-assertion were reënforced by their dominating ideas. Similarly their apt and energetic grasp of situations, readiness for emergencies, and forceful handling of complex difficulties have depended upon their possession of a stock of concepts

applicable to the various aspects of their work. Fitting such a concept to a situation is equivalent to making a decision. The fit may not be perfect, but it serves the purpose. Apparently some men come naturally by this sense of rational values; they form great conceptions and are made great thereby; they act with intelligent promptness and are known as able executives. In less momentous ways we find that our decisions are facilitated by bringing our problems into the light of general principles. These are assumed to have authority, and we act accordingly. The practical implication of this truth is that we may make a decision by applying a concept which we take to be important. The mental activity of defining the principle passes easily into that of deciding the point.

Ethical and religious principles are especially effective in this way. To bring a matter under the concept of justice is to go far toward settling it. Loyalty, obedience, helpfulness are ideas with strong emotional character; explicitly brought to bear upon a point, they energize the will to act accordingly. And so it is with religious principles. Conscious relation to a higher power and a belief in divine guidance through prayer make for decisiveness, sometimes with the certainty of mystical illumination. Paul's observation, "I can do all things through Christ which strengtheneth me," is from our present point of view simply a statement of psychological fact. Great decisions in the lives of thoughtful men not infrequently bear the religious character of felt harmony with the will of God.

A peculiarly powerful line of evaluative reflection is that of connecting a proposal with *the idea of the self.* My purpose has value if I feel it to be essentially *mine,* the expression of my real nature; whereas if the proposed deed is somehow inconsistent with *me* I refrain from doing it. The forces of established character, and more particularly the idealistic traits, our supreme aims and admirations, are always ready to interfere with an unworthy project and prevent it from being realized; counterwise, to bring a project into agreement with these forces is an effective way of securing a decision in its favor. Many a citizen volunteered for military or other service in the war because he knew that he would despise himself or invite the contempt of his associates if he didn't. Overworked doctors, teachers, and clergymen are enabled to perform their tireless round of duties by carrying in mind a professional ideal, the kind of medical or pedagogical or ministerial self which they desire to be. This idealism eliminates many an inclination to slacken effort. So too in the field of college study one develops energy by identifying a task with his conception of himself as a student, and his general and special educational purposes. A reflective idea of one's own character and aim in life is thus an agency of great power in the practical exercise of the will.

Such decisions are facilitated if we have an example to imitate. A deep, inborn tendency within us leads us to do what others do; it operates to some extent in animal life, and it is a fundamental and pervasive characteristic of mankind. Much of our

education, in fact, is little more than the copying of others. The perception of an act produces almost automatically a similar response in the percipient, and the same principle holds in the mental realm of ideas, emotions, and volitions. Hence we easily choose what others choose, reject what they reject, and in general follow their lead. Friendship offers conspicuous illustrations of this imitative tendency; many a person habitually settles perplexing points of conduct by asking "What would so-and-so do?" As a practical method of dealing with a problem it is occasionally worth while to observe reflectively how those whom we respect have met similar difficulties. Their example serves to suppress opposing inclinations and to strengthen the will with an assurance that the decision is right.

Finally, *decisiveness may be cultivated as a habit.* It is possible in small affairs, where nothing of great importance is pending, to practise quick and effective decision. A dozen times a day we have the alternative of actually doing something or letting the opportunity slip by us. The matter may be no more significant than, let us say, picking up a fallen newspaper, or sticking to a task for an extra five minutes, or refraining from some slight bit of self-gratification at the table or elsewhere. However small, it is none the less a genuine exercise of the will, by which one acquires the habit of dealing promptly and decisively with any situation that presents itself. That framed advice which hangs over so many office desks, "Do it now!" not only carries a counsel of everyday efficiency; it also points toward a decisive type of char-

acter. As one establishes a habit of any particular sort by repeatedly doing that thing, so in a more general way the habit of ready and firm decision is cultivated by actually deciding. It is not the magnitude and importance of the matter which count, it is the energetic way in which we grasp it.[1]

Defects of Will.—The ordinary defects of will include sheer inertia or laziness, hesitancy, procrastination, a pondering but effortless habit of mind, excessive impulsiveness, vacillation, and obstinacy. They are obviously of two sorts, which are characterized respectively by a lack and by an excess of "impulsion," and by a corresponding superfluity and deficiency of inhibitions.[2] Especially typical are *impulsiveness, hesitancy, obstinacy,* and *vacillation.* Because of their frequency and their fatal effect upon efficiency they call for special consideration.

Impulsiveness, however delightful in childhood, needs to be brought under methodical control. Its injudicious outbursts are prevented by forming a close mechanical association of the tendency with that of self-restraint, so that a hasty inclination immediately and automatically sets the inhibitory mechanism in action. This is the natural effect of painful experience of its consequences, and the connection may be greatly strengthened by reflection

[1] A recent writer (Barrett, in *Strength of Will*) advocates such exercises as slowly and regularly turning the pages of a book, standing quietly with folded arms for five minutes, and so on, the very tediousness of which, he says, offers good opportunity for the concentration of attention and self-restraint. Most of us would prefer tasks which have direct utility, even though slight, but there is psychological ground for holding that if such exercises were undertaken methodically and with the express purpose of cultivating will power, they would tend to produce this in some measure.

[2] Cf. James, *Psychology,* Vol. II, pp. 537, ff.

and purpose. Acknowledging as we do the danger of impulsiveness, and its pernicious effect on the stability of character, we try the more readily to overcome it by cultivating a thoughtful habit of mind.

The hesitancy of which we speak is chronic and is due to excessive thoughtfulness. One sees any project as beset by difficulties, objections, unpleasant consequences, "the other side of the matter." The impulse to do anything is frustrated by a fear of failure or blundering, or by an over-emphasis upon undesirable results. Thus "the native hue of resolution is sicklied o'er with the pale cast of thought," until reflective inhibition of action becomes an habitual disposition and cast of character. Responsibility is unwelcome, and decisions are made by drifting. Life, in fact, becomes an aimless drift, except in so far as it consists of mere routine which calls for no independent decision. Highly organized bureaucratic work is said to tend in this direction; the subordinate hesitates to take independent action in any matter lest he upset the system and incur rebuke from higher authority. Pathologically the defect assumes pitiable forms of practical helplessness in which every point of conduct, even trivial ones of dressing and eating, has to be settled by someone else. In lesser degree it is found in many persons who are perfectly conscious of it, and who long for greater decisiveness and initiative.

In such cases of timidity or fruitless pondering the important principle to hold in mind is that *action is necessary for life,* and that the hesitant

character, if not worthless, is hopelessly handicapped. Mistakes too, are usually less harmful than the failure to do anything. Any contemplated course is likely to prove satisfactory if it is undertaken intelligently. Such modifications and adjustments as may be necessary can be made later. If there are good reasons for a course of action we may fix attention upon it in the light of these reasons, perhaps, as Haddock suggests, with a preliminary "Attention! I resolve to will!" which takes us out of the rut of hesitancy and gathers momentum for the needed decision. In this way one may cultivate a habit of prompt action which on the whole is more profitable than the safety of inaction. This is not a justification of impulsive and thoughtless blundering, of course, but rather a method of overcoming inertia.

Obstinacy—that trait which has the peculiarity of being found exclusively in other persons—is especially baffling in that it is intensified by opposition. At times, all the instinctive forces of self-feeling combine tensely to resist constraint. Indeed in some individuals the condition passes quickly into a quasi-pathological state of blind refusal to obey, making correction hopelessly impossible. On such occasions the natural tendency of authority, especially in dealing with "balky" children, is to try to "break the will," a process which is usually unwise, since it may involve a permanently disintegrating shock or strain in the obstinate mind, not to mention the excessive emotional wear and tear, and frequent failure, on the part of the one who attempts it. It is best, of course, not to let such

conflicts arise. When they appear, and threaten to develop into pathological form, the psychological rule is often that of dropping the disagreeable matter until the nervous "set" has passed away. Tact also enables the parent or teacher to approach the difficulty from some other direction, so that other forces of character are brought into play. Calm reasoning prevails, showing the inevitable effect of obstinate action. Or a different emotional tendency is stimulated by kindness and sympathy, as when, for example, a friendly invitation succeeds where repeated commands have failed.

If there is one defect of will which is worse than others it is the irritating one of vacillation. To decide, change one's mind, then perhaps regard the original decision as the better and return to it, possibly following this with further wavering and uncertainty, is a waste of time and mental energy, a sacrifice of accomplishment and a disintegration of character. Fortunately it is a defect which the possessor himself loathes, and which he is glad to correct. Here, too, the beginning of reform is a little reflection upon the worthlessness of the vacillating self. It is a self which is doomed to failure. In the light of this truth one may *preface decision by a resolve not to change it,* so that when the moment of impending change appears there is additional resistance to be overcome. This resistance is increased by *recalling the reasons for the original decision,* which are usually sufficient to clinch it. If the decision is changed, indeed, the original reasons almost inevitably present themselves sooner or later, and seem to

demand a return. Merely reviewing them is likely to result in a conviction of their adequacy, and an unwillingness to change.

These practical counsels presuppose that the defects are habits of a not too deeply settled sort, and that there is a background of desire for an independent and steadfast character. The strength of this desire is the fundamental factor of reform; practical rules only serve to direct it effectively. Where one is content with drifting and shifting except for occasional moments of self-reproach, it is futile to look for the development of a powerful will.

Fatigue of the Will; Sources of Endurance.—Over-exertion of the will—oft repeated, long continued, or nervously intense exercise of it—produces a condition which Gulick aptly terms "will fatigue." It is not identical with muscular fatigue, though the latter may accompany it. Rather is it a nervous or mental state. Its symptoms are unsteadiness of attention, irritability, hesitancy or impulsiveness, difficulty in making decisions or in sticking to them when made, sometimes blind obstinacy, bursts of anger, or dull despair. Volition becomes spasmodic and erratic. The sufferer cannot keep steadily at work, but shifts from one thing to another, finding it easier to do a succession of trifling acts than anything of importance which calls for much effort. There is also feeling of helplessness, and a lowered moral resistance. At worst the nervous and moral breakdown may become tragic.

The cause of this condition is found, as was said above, in over-exertion of the will. Numerous petty

decisions, fussy responsibilities that are full of perplexity and worry, frustrated efforts to get down to business, baffling restraints, nervous attentiveness that leads nowhere—these are kinds of experience which produce will-fatigue. It is observable at times in almost everybody. Children show it as a result of strenuous play and social excitement, older persons as a consequence of work that is mentally exacting. Bodily fatigue increases it. It centers, as does the will in general, in the function of attention, which here is overstrained, so that instead of pursuing a steady course it exhausts itself in futile efforts to accomplish something. Just as physical struggling is the most exhausting kind of work—a few minutes of it wears out anyone—so a mental struggle, lacking a steady aim and the consciousness of progress, exhausts the will.

The practical counsels of applied psychology with regard to the fatigue of the will are first, prevention, and second, rest. Generally speaking, the condition may be avoided or at least kept within safe bounds. Many small decisions may be deferred, or turned over to others, or made automatically with a deliberate resolve not to worry about them. When a big task confronts us we ought not to try to get a lot of little ones out of the way first; this practice almost inevitably results in not undertaking the large one, because we use up more energy than we expected. "Do the big things first," and let the smaller ones go to odd moments. Much petty business must be turned over to subordinates, or even neglected, in the interest of what is more important.

Every college teacher knows that he can incapacitate himself for needed study or writing by conscientiously reading too many examination papers and deciding upon their grades. Especially when the lesser work involves perplexity and resistance it may be necessary to cultivate passivity, refusing to make the effort of settling the matter, or referring it to someone else and accepting his decision without question. Nervous quarrelling over insignificant matters is particularly to be avoided as a source of will fatigue and a preventive of large accomplishment. "Giving in" to others in little ways may mean the successful attainment of a vastly more important end because of the saving of will power.

Next, fatigue of the will, like fatigue of the body, calls for rest. This does not necessarily mean doing nothing—though in some cases the need is for solitude, inactivity, sleep—but rather doing something which does not require alert attention or difficult decision. Oftentimes within the limits of a task one can alternate the routine with the more exacting parts, so that the former serve as rest periods, and the will recuperates as it goes along. In general, however, it seems better to concentrate one's energies for a limited space of time, and then turn for rest to something distinctly different. Careful observation shows that we do more and are less worn out in this way. Persons differ, too, in their needed forms of rest. Some students can turn from hard mental labor to tennis or chess and find recreation therein. For many of us these pastimes add to the mental fatigue. Different kinds of work have their

appropriate forms of rest, light reading, physical exercise, play, sleep, and the desirable form should be different from the work, but the precise relation depends upon the individual and the demands which it makes upon his will. This is the true meaning of the aphorism that "a change of work is rest." Real rest is more than relief or restoration; it is an increase of power. "Rest is growth."

Professor James has shown that the self possesses reserve stores of energy upon which it does not ordinarily draw, but which under special conditions may become available for the exercise of the will. In strenuous athletic performance this is known as "second wind," and a similar phenomenon appears in the mental and moral life when persons show extraordinary endurance. In emergencies men fight or labor at their desks, women care for children and nurse the sick, with a persistent strength and an indifference to fatigue which astonish the observer. Individuals in sore straits sometimes learn to face the trials of life, meet difficulties, overcome temptations, with a power which apparently they had not previously possessed. Not only the dramatic crises of human existence, but also its more incessant and dreary burdens are borne with patient endurance that is none the less heroic because inconspicuous.

What are the sources of this power? In a general way we may designate them as ideas, emotions, and self-disciplinary practices which we do not usually experience or undertake. Excitement notoriously breaks down inhibitions and produces phenomenal discharges of energy. Love, hope, responsibility,

patriotism, religion, are some of the more familiar agencies which on occasion enable the possessor to work in this tireless fashion or pass through severe ordeals and emerge victorious. Certain religious cults are peculiarly successful in developing in their votaries a moral strength which overcomes hardships with serenity and power. Simple faith and prayer may accomplish the same result. The phenomenon has its bad side, its misuse and dangerous application, but it is nevertheless a most important aspect of human nature.

QUESTIONS AND EXERCISES

1. What is the general meaning of the term "will"? Name as many distinct forms of will exercise as you can.

2. Show how persons differ in their characteristic type of will effort.

3. State the general problems of will training. Why is power of will as important as brilliancy of intellect?

4. What are the principal elementary factors or processes into which the will may be analyzed? State the principle of "ideo-motor action" and show why ideas do not all pass directly into action.

5. Indicate briefly some of the ways in which opposing tendencies are overcome.

6. Show the importance of a detailed purpose or plan in carrying out a resolution. In facilitating initiative. In producing perseverance.

7. Show explicitly why a daily schedule of duties is a help to the will. What kind of schedule is most effective?

8. Explain the assertion that inhibitions may be overcome and decision reached "subconsciously."

9. Show how persistent voluntary attention to a proposed end is related to decisiveness.

10. Why is reflection upon "principles" a powerful aid to

the will? What kinds of principle are most effective in this respect?

11. Show the peculiar importance of the idea of the self in relation to decision.

12. Indicate some practical problems of situations in which decisiveness is facilitated by imitation.

13. Show how the habit of decisiveness may be cultivated methodically.

14. What special considerations are effective in correcting impulsiveness? Chronic indecisiveness or hesitancy?

15. How should one treat a case of nervous obstinacy? What principles or rules may be employed to prevent vacillation?

16. What is "fatigue of the will"? What are its causes? Its moral effects?

17. How may fatigue of the will be avoided? What is "rest"? Show how it differs in individuals.

18. Explain the assertion that we have reserve stores of volitional energy upon which we do not ordinarily draw. How may these reserves be "tapped"? What is the danger in the matter?

PART THREE
MIND AND HEALTH

CHAPTER XI

PSYCHOTHERAPY

General Meaning of Psychotherapy.—Psychotherapy is *the treatment of disease by controlling the mental processes of the patient.* It is to be distinguished from the use of physical agencies, or "physicotherapy" as it may be called, such as drugs, bathing, massage, electric stimulation, and the like, which act or are supposed to act directly upon the physical organism. Psychotherapy may also utilize physical agencies, but when it does so it is because these produce a desired mental effect. The two kinds of therapeutics ordinarily work together. The indirect effect of customary medical treatment in suggesting recovery is quite as genuine as its physiological effect, and sometimes even more important.

It is to be distinctly noted that psychotherapeutic method applies to physical as well as to mental disease. It may serve, for example, to bring relief from bodily pain, or, by instilling hope and confidence into the patient's mind, to cause subtle organic changes which make for physical well-being. It also applies to mental disorders, especially the "functional neuroses" characterized by worries, fears, hallucinations, constant sense of fatigue, abnormal impulses, and general "nervousness." It is not to

be confused with "psychiatry," however, which is the study and treatment of insanity—mania, dementia, paranoia, idiocy, and other dread diseases of the mind.

Further, let us observe that psychotherapy implies not simply "mental healing," but also the diagnosis and the prevention of disease. In one of its most recent forms it involves "psychoanalysis," or the discovery of the causes of disease by expertly subtle examination of the mental processes of the patient. And it also involves prophylaxis or hygiene of the mind which skilfully wards off both mental and physical disease. In one way or another, however, all these different functions of psychotherapy are included in our definition of it as the treatment of disease by control of the mind.

The mental processes which operate therapeutically may be either conscious or subconscious. Deliberate resolution and buoyant hope have far-reaching effects, while marginal feelings of confidence and expectancy are also efficacious. A general background of assurance, such as is ordinarily possessed by the healthy, is quite as important as any focal idea or assertion of well-being. Commonly the conscious and subconscious factors work together, since the general unity of mental life involves their close organic relation. Thus conscious suggestions of a healthy sort find lodgment in the depths of the mind, just as in pious lives the effect of Bible reading and religious meditation continues long after one has turned to other things. Psychotherapeutic practice consists in no small part of maintaining sys-

tematically and methodically the right kind of mental undercurrents.

Just how the mind influences the body, metaphysically speaking, is not known. We are none the less sure, however, that our ideas and emotions and volitions do affect circulation, digestion, glandular secretion and other vital processes, and that in some mysterious way the nervous system serves as intermediary between the two parts or aspects of our psychophysical being. We may never discover the subtle linkage of causality by which mental conditions produce bodily effects—though of course we ought not to assume hastily the impossibility of doing this. But whether we do or not the empirical fact remains that just as certain mental states admittedly exercise a deleterious effect in sickness, so others are beneficial, and that a scientifically controlled mental regimen has unexplored possibilities of health. To ascertain the mental causes of disease, and to replace these with other mental states which make for health is the general aim of all psychotherapy.

The Development of Psychotherapy.—The rise of psychotherapy is a subject of fascinating interest. Its roots are found in the primitive medical practices of savagery, such as the use of absurd or disgusting "medicines," beating of the sufferer, beating of tom-toms, elaborate incantations, and the like. This treatment always expressed some superstitious theory of the nature of disease, in general the belief that it was due to the presence of evil spirits who must be vigorously exorcized, but it had no direct physical value. When it benefited the patient, as

unquestionably it sometimes did, its efficacy was by way of the mind. The mental condition induced was such as to facilitate the natural processes of recovery in spite of the physical and mental hardships of the treatment. Reverence for the witch-doctor or medicine-man with his mysterious drugs and arts served to strengthen hope and produce cheerfulness which in some cases no doubt considerably aided the work of nature. This was unintentional psychotherapy of a crude and ignorant but occasionally effective kind.

Substantially the same may be said of medical practice on the next higher level of culture. The healer, usually priest, saint, magician, or king, owed whatever success he attained to the state of mind which he inspired in his patient. His incantations, prayers, "laying on hands," and other arts tended to beget confidence, while health charms and talismans, relics, fearful and wonderful drugs, healing springs, groves, shrines, and "temples of health" all served the same purpose. Need it be added that to a considerable extent the medical art of the present day owes its efficacy to similar influences? The doctor's personality, the assumed value of his medicines, the reputation of the sanitarium, are often by no means the least important factors in the recovery of the sick.

Historical medical practice, then, has been essentially though for the most part unconsciously psychotherapeutic. We find in ancient culture, particularly in Greece, some small effort of a genuinely scientific sort toward the empirical investigation and

rational treatment of disease, but in general the long and varied art of medicine follows unwittingly the devious channels of impressive superstition and the suggestibility of the patient.

The modern development of an intelligent and self-conscious psychotherapy began with the discovery of hypnotism. The art of hypnotic suggestion had indeed been practised by gifted persons in ancient and medieval times, and various astrological and physical theories, especially that of "magnetic influence," had been devised to explain the phenomenon. In the latter part of the eighteenth century Mesmer, a Swiss physician who had delved deeply into the learned occultism of the time, developed the practice of hypnotism and an explanatory theory of "animal magnetism," the flow of an invisible but vital fluid from one person to another. His performances with the "baquet," a large iron-bound bowl which he constructed to facilitate the business of dealing with large numbers of subjects,[1] and his consequent relations with his colleagues of the medical profession, whom for the most part he failed to convince of the genuineness of his accomplishments, and with the French government which was besought to subsidize him, are a dramatic story. His methods were communicated to other countries by pupils and followers. Step by step the art was perfected and its theoretical basis clarified. James Braid, an English surgeon who practised "mesmer-

[1] The subjects, taking hold of spikes which projected above the rim of the bowl, were supposed to receive therefrom currents of the invisible fluid or "animal magnetism." In general, the prestige of Mesmer and their own expectancy produced hypnosis.

ism" successfully in the middle of the last century, and to whom the term "hypnotism" is due, believed the phenomenon to be the result of fatigue of the optic nerve, and wrote a book of classical importance under the title "Neurypnology." In 1860 Liébault opened a public dispensary at Nancy which attracted large numbers of patients and many studious physicians. His theory of hypnotism, that it is due to "suggestion," is distinctly psychological, and his book, "Du Sommeil," like Braid's work, is a classic. At the Salpétrière in Paris, Charcot and his followers also investigated hypnotism with great thoroughness, but explained it physiologically as a phenomenon of hysteria, i.e., as the effort of an abnormal nervous constitution. Following these pioneers numerous medical scientists in Europe and America studied the subject with the result of establishing it firmly upon a scientific basis. Though never accepted widely by the profession of medicine, or wholly dissociated from popular demonstration and quackery, it has nevertheless obtained a footing as a genuine therapeutic method. Many physicians who do not use hypnotism made deliberate use of the art of suggestion as an accessory of their practice. Hypnotism has perhaps performed its most important service in compelling recognition of the influence of mental processes upon disease, a truth much broader than hypnotism itself.

The recent work of Freud and his followers constitutes another epochal development of psychotherapeutics. The central feature of Freudian theory is that mental and physical disorders are often

the outworking of suppressed interests, especially those of sex. The elaboration of this theory is exceedingly technical, and the "psychoanalytic" methods of diagnosis and removal of the concealed source of the disorders have become a highly expert performance. We shall consider some of its principal psychotherapeutic features, and also those of hypnotism, in the two following chapters.

On the whole the medical profession has shown comparatively little interest in technical psychotherapy, in spite of its own acknowledgment that the mental condition of the patient is effective for good or ill, and of the further fact that by far the larger part of human suffering can be reached more effectively by psychotherapeutic method than by any other. Some few doctors have employed hypnotism; more have accepted Freudian theory and adopted its methods. A little psychological instruction is given in medical schools, and the arts of suggestion are commonly used in sanatariums. Scientific psychotherapy is practised by specialists. But broadly speaking the medical profession still follows its traditional habit of regarding the mind of the patient only as an incidental feature of the case, a feature which can best be dealt with in the simple way of professional dignity, cheerfulness, and encouragement. More pointedly, there is a disparaging sentiment with regard to psychotherapy, especially in its religious forms, and a disposition to identify it with medical quackery. This attitude is due to several factors—first of all, no doubt, the superior technical development of their own form

of medical science. Baffling as are the physical symptoms of disease, they are definite in comparison with the difficulty of understanding the significance of mental processes. The undisputed fact that many troubles are "imaginary," too, makes natural the assumption that distress of mind is comparatively unimportant, or may be controlled by the patient himself. And it must be acknowledged, further, that the historical association of psychotherapy with quackery is such as to prejudice conscientious practitioners against it, and to confirm neglect. Unfortunately a consequence of this neglect is that psychotherapy becomes all the more exclusively the ignorant practice of quacks and misguided religionists who for the most part utterly lack medical training and a scientific point of view. Happily the antagonism is giving way to the advance of the science, as the absurdities, the exaggerated claims, and the conspicuous failures of psychotherapeutic charlatanism themselves give way to sound knowledge and increasing skill.

Scientific and Religious Psychotherapy.—The development of medicine shows a double character which is of far-reaching significance for our study. It is partly *scientific* and partly *religious*. From the former point of view disease is regarded as an accidental consequence of physiological laws, for which certain remedies are naturally appropriate. There may be much mystery about the disease and the cure, but both are looked upon as works of nature. We find traces of this view even in ancient times, and it becomes more comprehensive and powerful

as intellectual culture develops. The other attitude is quite different. It looks upon disease as the work of an evil spirit who interferes with the course of nature. Accordingly it is the business of the physician to exorcize the demon and to enlist divine assistance for the afflicted. It is universally true, of course, that the more important phases of life come within the purview of religion, and so from the very beginnings of human reflection sickness has been interpreted religiously. The doctors of the past, therefore, were usually priests and other holy men who cured by means of sacred books, rites, relics, and the like.

Through most of the history of human healing these two attitudes have not been sharply distinguished in practice, but have blended with and reënforced each other. Natural causes and spiritual causes were confused; prayer and incantation supplemented medicine. At the present time the attitude of the average man is an uncritical combination of the two views. He takes medicine faithfully, and he also believes in the efficacy of prayer. Religious denominations maintain hospitals in which the most expert medical science is practised, and many a physician is essentially devout in his labors among the sick

There has been an increasing divergence, however. In the last few centuries medical science has learned to do without reference to spiritual agencies, and for the most part to proceed independently of religion. It studies the nature of the human body and experiments in the way of treatment purely as a matter

of cause and effect. It looks upon religious men and cults which attempt to practise healing as ignorant impostors; upon their beliefs as sheer superstition. It finds dyspepsia to be due to improper food and habits of eating, fevers to be the effect of micro-organisms which have secured a lodgment in the body, and so on. Counterwise, certain chemical and physical agencies restore health. In this business there is nothing that is essentially religious. On the other hand the religious point of view has remained firmly fixed in the human mind, and has produced important religious movements, revivals of "faith healing" and sects such as Christian Science, which wholly or partly reject the natural science of medicine.

This twofold character of the history of medicine is significant for our consideration because it extends into the special field with which we are concerned. There is a religious as well as a scientific psychotherapy. The latter is interested in the laws of the human mind in their relation to health, the specific connections between mental processes and physical diseases, and the mental regimen by which sickness may be avoided or cured. These are regarded as laws of nature, to be studied and applied without reference to religion. The former, on the other hand, lays constant emphasis upon the spiritual forces which produce health and disease, upon sin and ignorance, upon faith and the righteous will. It is not given to the analysis of mental processes, or to the investigation of the natural laws of the mind in relation to the body. If it employs psychology,

as it occasionally does, this is for the purpose of obtaining reënforcement of the religious faith to which it is already committed, and with which it operates.

Historically, as we have noted, the primitive theory of the nature of disease attributes it to the presence of malignant spirits, who must be driven away by noise, beating, charms, and incantations. Such slight beneficial effect as the treatment possessed was of course by way of its effect upon the patient's mind. A more reflectively evolved form of the theory appears in the Hebraic conception that sickness is due to the sin of the sufferer, or of his forbears or rulers, and is a punishment administered by a righteous God, acting sometimes through the medium of a demon. In such a case health might be restored by repentance and sin offerings, or by vicarious suffering, the important point being the reëstablishment of a right spiritual relation with God. Much of the religious treatment of sickness, however, has ignored its source, or has frankly attributed it to natural causes, but has dwelt emphatically upon the power of God to heal, and the possibility of obtaining healing through faith. "Divine healing" has been a constant feature of historical Christianity, frequently repeated in dramatic form as priests, saints, and other men of God displayed mysterious power of curing the sick, the halt, and the blind. That their success, sometimes notable, was due to the suggestive force of the health idea, exerted upon the patient's mind with the tremendous prestige of religion, is clear to the

student of psychology. The work of John Alexander Dowie in this respect is typical.

More distinctly philosophical forms of religious psychotherapy are found in New Thought and Christian Science. Their origin is well known. "Mesmerism," brought to this country from France, was studied by Phineas Parker Quimby, whose reflections upon it in relation to his own ill health and that of his neighbors led him to the conviction that disease has its source in the mind in the form of wrong beliefs, and consequently that it may be cured by ascertaining the truth of the mind's potential superiority to it. He practised locally, and with success. Among those who visited him were a Mrs. Patterson, afterward Mrs. Mary Baker G. Eddy, the founder of Christian Science, and also W. F. Evans and J. A. Dresser, in whose able writings are found the roots of the system of religious philosophy called New Thought. The doctrines of these cults ascribe disease to ignorance rather than to sin, and teach that health comes through a knowledge of the Truth, the central feature of which is the superiority of spirit over matter. Finally we may note that a deliberate attempt to combine religious with scientific psychotherapy has been made by the so-called Emanuel Movement, which for a time enlisted the thoughtful coöperation of certain doctors and clergymen, but which apparently proved not permanently workable. These various forms of religious psychotherapy will be discussed more fully in a later chapter.

Both the religious and the scientific forms of

psychotherapy are unquestionably effective. The advantage of the scientific method is that of science in general, i.e., definiteness of concepts and the clear understanding of natural laws of cause and effect which points toward effective control. On the other hand the superior power of religious faith in affecting mind and body is far greater than many a "medical materialist" supposes. It often reënforces therapeutic suggestion as nothing else can do, and may even bring success where science fails. The meeting point of the two methods is found in the patient's will, the right direction of which is on the one hand the object of religious appeal, and on the other, as seen from the scientifically psychological point of view, an essential condition of the psychophysical processes which make for health. Accordingly the two forms of treatment properly supplement each other, even though in practice there is often antagonism between them.

The Scope of Psychotherapy.—To what diseases is psychotherapy applicable? What are the various fields of human ailment in which its methods are distinctively, or primarily, or incidentally to be employed?

The answer is that psychotherapy in some form or degree is applicable to every kind of disorder which afflicts the mind or the body. As was pointed out at the beginning of this chapter, the "treatment of disease by control of the mental processes of the patient" includes bodily as well as mental diseases. It is unquestionable that circulation, digestion, glandular secretion, and other bodily

functions are affected by the mind. The bad effect of certain mental conditions, for example, the interference of worry with digestion and the depression of circulation by grief, is obvious. Counterwise, the cultivation of appropriate states of mind facilitates these physical processes. We do not need to know just how this takes place, any more than we need to know just how the idea of reading a book works psychophysically with the result that we pick it up and turn its pages. Somehow our mental life, operating through the nervous system, regulates the bodily functions, and consequently in so far as disease resides in the organs which perform these functions, or depends upon their operation, it may be lessened in some measure by making the patient forgetful of it, or indifferent to it, or hopeful of overcoming it. Even when the case is hopeless, as in the graver developments of cancer, consumption, and Bright's disease, it may be possible to alleviate pain or to produce courage or cheerful resignation by subtle forms of suggestion. Those who have lived in close association with the sick know that their needs are sometimes mental quite as much as physical. Psychotherapy means here only the methodical perfection of a practice which always characterizes the wise physician. As an adjunct of physicotherapy it is of far-reaching importance.

The principal application of psychotherapy is found in the field of mental disorders. These we may conveniently divide into two classes. First, there are the various forms of insanity—occasional,

periodic, or persistent—such as epilepsy, dementia, mania, melancholia, paranoia and idiocy, which presumably result from some constitutional condition of or serious injury to the brain. With these psychotherapy has little to do. In dealing with them the psychiatrist may use psychotherapeutic methods, but rather for the purpose of incidental control than for cure. Soothing and encouragement, the counteraction of hallucinations, and the suggested restraint of dangerous impulses lie within the scope of mental treatment in this field. Incipient cases are sometimes helped. In general, however, no great amount of permanent benefit is to be expected.

These grave disorders shade by degrees into milder ones which do not involve such serious constitutional defects of the nervous system, and which do not so completely unfit the individual for social life. In these cases the trouble is regarded as "functional" rather than structural, i.e., whatever basic defect exists in the structure of the nervous system is so obscure as to elude our powers of observation and analysis, hence we can only say that the mind-brain system works wrongly. The great triad of "psychoneuroses" comprises neurasthenia, psychasthenia, and hysteria. These more or less common afflictions of mankind are the special domain of psychotherapy, and it is here that the science is making its greatest technical advances. While physical treatment of them may also be desirable, cure often depends essentially upon mental factors.

As a brief description of the psychoneuroses we

may borrow the following from Münsterberg's "Psychotherapy," [1] beginning with "that neurasthenia which develops on the basis of inherited disability. Lack of energy resulting from a feeling of tiredness, a quick exhaustion, a mood of depression, an easy irritation, even despair and self-accusation, sullenness and fits of anger, cranky inclinations and useless brooding over problems, headache and insomnia characterize the picture which everyone finds more or less developed in some of his acquaintances. If we classify symptoms, we may separate from it that which we nowadays are inclined to call psychasthenia. An abnormal suggestibility for autosuggestion stands in the foreground. Fixed ideas and fixed emotions, especially fears, trouble the patient. . . . The patient is perfectly well aware that his ideas and his emotions are unjustified, he himself does not believe in them, and yet they come with the strength of an outer perception and with the vividness of a real attitude, and his whole mental equilibrium may be upset by the continuous fight against these involuntary interferences. . . . Here belongs the fear of open places or the fear of touching certain objects, the fear of doing harm to others or the fear of deciding actions wrongly, the fear of destroying valuable things or the fear of being the center of public attention, the fear of crowds or of closed doors, of altitudes or of bridges. And in all cases emotional reaction may set in with anxieties, and bodily symptoms such as palpitation of

[1] Pp. 171-175.

the heart may result, whenever an effort is made to disregard the nervous fear. There is perhaps no group of patients which so much deserves the most careful efforts of the psychotherapist. Still more than the hysterics they suffer from the fate of seeing their ills counted as not real. For them everybody has the good advice that they ought to overcome their fancies; and yet they feel their life ruined with the endless fight against the overpowering enemy. And if anywhere, it is here that the psychotherapist is successful. . . .

We have, after all, the same psychasthenic state before us when the obsession has impulsive character, from the mere abnormal impulse of lying, or making noise in a quiet place, to that of stealing, indecent speech, arson, and perhaps ever murder. . . . Quite nearly related to it are the manifold variations of abnormal and perverse sexual tendencies. The psychiatrists are perhaps too much inclined to bring all these pathological impulses and desires, fears and anxieties, into the nearest neighborhood to real insanity. . . . The psychologist will be more inclined to emphasize their relation to simple neurasthenia which itself imperceptibly shades over into our normal life.

All neurasthenic and psychasthenic disabilities show a certain emotional continuity and uniformity. It is the emotional instability and the quick alternation of symptoms which characterize hysteria or rather the hysterias. . . . The rapid changes of the intense moods of the patient usually stand in the center. Torturing obsessions, abnormal

impulses, over-suggestibility, hypochondriac depressions, paralysis of arms or legs, anæsthesia and paræsthesia, a mental stupor and confusion, illusions and perceptions of physiological symptoms may work together in spite of his, or rather her clear intelligence. It is probably on a hysteric basis that somnambulic states arise during the night, and from them a straight way leads to those mental attacks after which the memory is entirely lost, or for which fundamental associative connections are cut off. And from here we come to the exceptional cases of alternating personality. The more we recognize the myriad symptoms in the hysteric patient as products of the emotional instability, of autosuggestibility and of inhibition, the more we understand the almost miraculous result of psychotherapeutic treatment. Autosuggestions can be fought by countersuggestions, anæsthesia and paræsthesia can be removed often in an instant, dissociated personalities may be built up again through hypnotism, the most severe bodily symptoms may disappear by influences in a waking state. Hysteria alone would justify the demand that every physician in his student days pass with open eyes through the field of psychology. . . ."

Everyday Psychotherapy.—To whom does the field of psychotherapy properly belong—to the specialist in mental diseases, or to the general practitioner of medicine, or to the psychologist, or to anyone who is interested in the subject? The answer is that it belongs to all these persons under various conditions and in various degrees. Of

course it cannot be too strongly emphasized that in serious cases diagnosis and treatment are the work of the trained expert, and that it is foolish for others to practise psychotherapy without consulting him. An incalculable amount of harm is done by the assumption that psychotherapeutic methods can safely be employed by pseudo-scientific charlatans, religious zealots, and others with a smattering of professional information. Half educated prying into the recesses of the mind and blundering interference with its delicate mechanism are inexcusably pernicious. Hypnotism and psychoanalysis are especially dangerous tools in the hands of anyone except those who have been scientifically trained to use them.

But with this acknowledgment we must also admit the further truth that the afflictions which are successfully removed by psychotherapy are of various degrees of severity. Innumerable persons are slightly neurasthenic—not enough to need the attention of a specialist, but enough to suffer and to make others suffer a good deal of unhappiness, and to call for methodical treatment. Many who regard themselves "perfectly well" physically are occasionally troubled by neurotic symptoms, fears, worries, harassing ideas, and unhealthy impulses which cast a shadow upon life. Here is the field of an "everyday psychotherapy" such as any intelligent person may safely and profitably practise. "A little knowledge is a dangerous thing," no doubt, but it is not necessarily harmful, and usually it is better than none. The evil results of psychothera-

peutical quackery may be matched by the good effects of methodical "home treatment" of ourselves and others in the mild but very prevalent forms of psychoneurosis. It is highly desirable that this art, including the intelligent discrimination of cases in which it may properly be applied, should enter more broadly into our system of higher education.

It is desirable also that physicians in general practice, many of whom are extraordinarily gifted in psychotherapeutic skill of a practical sort, should possess scientific knowledge of the subject. The unquestionable success of religious healers in dealing with certain cases of disease which have been correctly diagnosed by regular practitioners who nevertheless failed to cure, shows how large a part is played by mental factors both in the causation of the disease and in recovery from it. These facts, as eminent leaders in the profession have pointed out, are a challenge to medical science. It is a serious error to allow an effective method to pass so extensively into the hands of those who lack scientific knowledge of the human body. The danger of inexpert practice by "mental healers" is not to be disregarded because it is sometimes remarkably successful. In genuinely psychotherapeutic cases physical treatment may be quite as requisite as mental. Lacking the former, the effectiveness of the latter is often temporary; the patient, after a brief period of felt or fancied improvement, suffers a recurrence of the symptoms, loses confidence, and goes from bad to worse. There is danger, too, in the uncritical inhibition of pain, which may be needed

to restrain the sufferer from harmful activity. As a general rule in the case of physical disease such as calls for medical attention, technical psychotherapy can be used safely only by or under the direction of those who possess scientific physiological knowledge and are able to perform reliable diagnosis. As an adjunct to regular medical practice it may be of great value, and it remains for the profession in the future to add this means to the others by which it relieves the suffering of mankind.

QUESTIONS AND EXERCISES

1. Define psychotherapy. How does it differ from psychiatry?

2. Show that ordinary medical practice has psychotherapeutic features.

3. How is the occasional success of primitive medical practice explained?

4. What were the agencies of healing in ancient and medieval times?

5. What psychotherapeutic method was the first to undergo scientific development? State some of the principal facts about Mesmer.

6. State the fundamental principle of Freudian psychotherapy?

7. How is the prevalent medical disfavor with regard to psychotherapy explained?

8. What two principal ideas about the nature of disease and its proper treatment have characterized the development of medical practice?

9. Distinguish carefully between the scientific and the religious conceptions of psychotherapy.

10. What are some of the principal contemporary forms of religious psychotherapy? In what respects do they differ?

11. What is the general relation of psychotherapy to bodily disease? Show by an illustration how it may be effective in a particular case. How may it be dangerous?

12. What is the meaning of the term "psychoneuroses"? How do they differ from insanity?

13. What are the principal symptoms of neurasthenia?

14. What is the characteristic feature of psychasthenia? Indicate some of its typical symptoms.

15. What is the characteristic feature of hysteria? What extreme forms does it sometimes assume?

16. Show that specialists, regular physicians, and persons without medical training may properly practise psychotherapy in different ways.

CHAPTER XII

METHODS OF THERAPEUTIC SUGGESTION

The Therapeutic Application of Hypnotism.—Scientific psychotherapy arose from the discovery of hypnotism. Beginning with Mesmer—that remarkable combination of scientist and charlatan—a long line of investigators perfected the theory and practice of hypnotic suggestion. The possibilities of the trance state for the treatment of suffering were early recognized, and the art of producing this state spread quickly from its home in France to the other countries. The French schools of Nancy and the Salpétrière disseminated the ideas and the methods throughout Europe. Many of the students of the subject were physicians, who were enabled by their special knowledge to eliminate the superstition and quackery with which the practice of hypnotism had been burdened, and to give it scientifically technical form.

Nevertheless the medical profession has never accepted hypnotism as a therapeutic method; comparatively few practitioners of thorough medical training have adopted it. It has been used much more in Europe than in America, but nowhere has it attained a status other than that of specialism, and for the most part it is ignored or looked upon

with distrust by doctors. It has been thus thrown into the shadow of medical disfavor for several reasons, the fact that disease in its physical aspects seems to call for essentially physical remedies, the mysterious subtlety of the process of hypnotism in contrast to the objectivity and definiteness of physicotherapy, the failure of schools of medicine to include adequate psychological training in their curricula, and the historical association of hypnotism with public spectacles and quackery. A few specialists make habitual use of it in their practice, and regard its eclipse by other methods as unfortunate, holding that so valuable a means of relieving human suffering ought not to be rejected. Experts affirm that its effectiveness in application to certain classes of disorder, especially psychoneuroses, is unquestionable, and that the difficulties and dangers in the use of it are no greater than those of other forms of medical practice. In spite of occasional commendation, however, it remains outside the pale of medical respectability. Even those physicians who are aware of its effectiveness are for the most part inclined to believe that better results can be obtained by other methods. Of late it has been further overshadowed by the development of hypnoidization and psychoanalysis.

Hypnotism as a medical resource has three main uses, diagnostic, anesthetic, and curative. Its diagnostic value lies in the fact that under some conditions it may facilitate the discovery of the cause of a disorder. Where this cause has been forgotten in the lapse of years, or has been deliber-

ately excluded from the mind, hypnotism sometimes serves to bring it to light. It has also been used as a means of distinguishing between true and false symptoms, since the latter may in some cases disappear under hypnosis. In general, however, its diagnostic value is acknowledged to be slight, on account of the extraordinarily suggestible condition of the subject, whose report or behavior is quite as likely to be a reflection of the operator's suggestions as a revelation of essential facts.

Anesthetically, hypnotism has been employed with success for a wide variety of surgical operations, including dentistry and obstetrics. It is also used simply to relieve pain. A high degree of analgesia may be induced, and the after effects are said to be less troublesome than those of drug anesthetics, perhaps by virtue of a slight posthypnotic continuance of the dissociation. Other methods of anesthetization are more reliable, however, and it is only in especially suggestible cases in which ordinary anesthetics are useless or dangerous that hypnotism is to be preferred.

Hypnotism finds its principal employment as a therapeutic resource in the removal of symptoms and their causes by posthypnotic suggestion. It is applicable mainly to functional disorders which occur independently or as an accompaniment of bodily disease. The hypnotist can permanently dispel pain, induce sleep, banish fear and anxiety, put an end to an obsessing idea, overcome morbid cravings and evil impulses. Suggestions take the form of insistence that the headache will not return

after the subject emerges from the trance, that the hallucination will fade away, that the feared thing or situation really has no power of harm, that liquor or drugs are disgusting, that temptation will be met promptly by a certain kind of action, that strength and hope and happiness are returning and will remain. In some cases a single treatment is sufficient; in others frequent application is necessary; in still others the method must be continued over a long time. Under some conditions it fails. But there can be no question that it serves occasionally to annihilate certain types of disorder.

Furthermore, hypnotism has been proved to possess great value in the treatment of the "protean disease" of hysteria, with its manifold and constantly changing symptoms. Particularly in dealing with dissociation of personality, including some classic cases which are of great importance in the history of psychotherapy, it has been indispensable. Thus in the famous case of Miss Beauchamp, Prince was able by expert hypnotic suggestion not only to produce and remove amnesias, but ultimately to resynthesize the dissociated systems of mental processes into normal unity. In general it is not applicable to insanity, since it requires a mental coöperation which can rarely be obtained from the insane.

Finally, hypnotism may be useful in cases of organic disease, partly by engendering a peaceful, hopeful state of mind which reacts beneficially upon the patient's physical condition, and partly by abating such functional disorders as happen to accompany the malady. Moll remarks, "In many

organic diseases, the functional disturbance, which we usually consider the symptoms of the organic disease, extends much farther than the direct influence of the organic lesion justifies."[1] The lessening of pain in severe bodily ailments is itself highly desirable, as is also freedom from fear and anxiety. There is a possibility, of course, of rendering a patient insensitive to pain which is a natural sign of danger, for example in the action of the heart, and so making him incautious in his behavior. With proper discrimination, however, hypnotism may be employed helpfully in conjunction with other forms of treatment, though as a matter of fact it is seldom if ever used in this way. Like psychotherapy in general it has a potential relation to almost every type of disease, and it perhaps remains for the medical art of the future to make use of the lighter hypnotic and hypnoid states to establish appropriate mental conditions in the patient.

The practice of hypnotism by anyone except a trained specialist, however, is attended by much uncertainty and even danger. Unexpected mental results sometimes appear, undesirable emotions and impulses, which only an expert can remove. If, as occasionally happens, the operator loses control of the subject, the latter may experience something like an exaggerated nightmare, and suffer a severe mental shock before he emerges from the hypnosis, as he eventually does sooner or later. The writer once heard a distinguished hypnotist describe an incident of his own practice in which the subject,

[1] Moll, *Hypnotism*, p. 313.

through misunderstanding of suggestions, received an unintentional suggestion of something ludicrous, and responded by paroxysms of laughter which threatened to pass beyond control. In another case the operator, an amateur, failed to waken the subject from a trance, and unfortunately suggested his own helplessness by his words and manner, with the result that the subject became convinced that he could not waken, and hours elapsed before the state came to its natural termination in fatigue and sleep. There may also be after effects of a troublesome sort unless these are properly guarded against. Most of the common fear of hypnosis is unjustified, as authorities agree, but there can be no question that in the hands of a tyro the performance is genuinely dangerous and sometimes actually harmful. Only the professional psychologist and physician have the moral right to use it. Some eminent psychotherapists have found that they cannot employ it to advantage, either because the patient is unalterably opposed to it, consciously or subconsciously, or because they themselves happen to lack the peculiar personal qualities which are requisite in order to make it effective. Some find, too, that other methods which involve less dissociation are preferable. On the whole the current tendency of psychotherapy is to utilize as much as possible the normal processes of the mind.

Hypnoid Psychotherapy.—As was indicated in the foregoing section, the limitations of hypnotism have led many psychotherapists to use other and less abnormal methods of suggestion in place of it.

Especially important in this respect is the process of "hypnoidization," as developed by Sidis, the principal discoverer of its therapeutic possibilities, and others. The state of mind to which the term refers is the peculiar conscious condition called "hypnagogic" or "hypnoid," in which the subject is half asleep and half awake. As a normal phenomenon this of course has long been observed. Many a reader of these pages has no doubt experienced moments between sleep and waking, characterized by more or less vivid dream imagery, and yet retaining vague perceptual relations to surroundings. One hears real sounds or even sees objects while the partially dissociated mind proceeds along its dreamy approach to sleep. Persons differ much in their susceptibility to this condition, and it also varies greatly in depth, duration, and stability. In most instances it is minimized by the natural tendency to fall asleep, or on the other hand to wake up through attention to external stimuli. Under favorable conditions it ranges from a few seconds to several minutes. Those who experience it sometimes develop a considerable power of control of its contents and progress, fashioning the dream fancy to suit themselves, or uttering words and sentences of automatic speech.

The hypnoid states, like hypnosis, are especially favorable to the working of suggestion, and accordingly they may be utilized as means of therapeutic suggestion and autosuggestion. The natural hypnagogic condition antecedent to or consequent upon sleep lends itself admirably to this purpose.

In it the subject may apply moral or hygienic auto-suggestions to himself, thinking and murmuring them over until the idea is subconsciously ingrained in the mind. Quackenbos says, "I advise my patients as they are about yielding to slumber to say to themselves that they will no longer be slaves of the imperative conception or of the evil habit which is crippling their best expression." For example, "An alcoholic addict, actuated by a sincere desire to break the shackles of the despotism and go forth with capacity for the higher joys of life, is urged to think persistently as he is falling asleep in lines like these: 'Whiskey is unnecessary to my physical well-being; it is creating structural changes in vital organs; it is destroying my mentality and blunting my moral sensibility. I do not need it, and shall no longer use it either in mere bravado or to hide from my vision conditions that are insufferable. I shall depend absolutely on the units of energy legitimately manufactured out of nutritious food, good air, exercise, and sleep. I am done with alcohol once and forever. The appetite for it is destroyed in my being, and I no longer admit capacity for temptation. From this hour it shall be impossible for me either to desire or to take a drink for any conceivable reason. I do not want it. I do not need it. I shall not miss it.'" [1] Similarly the neurasthenic can implant in his mind by hypnagogic declaration such purposes as these: "I will not think about or talk about my personal ills and misfortunes. I will fix my attention on the

[1] Quackenbos, *Hypnotic Therapeutics,* pp. 82, 83.

brighter side of my daily life. I will show a cheerful face and speak cheerfully to all whom I meet. I will look with sympathy for the sorrows of others, and try to help them." Given a sincere desire to accomplish the expressed aims, this method of autosuggestion has real power.

Since children are especially likely to have hypnagogic sleep it would thus appear, on psychological principles, that there is virtue in the sleepy utterance of bedtime prayers. It is even asserted that parents may take advantage of the hypnagogic condition to whisper educational and moral maxims in the child's ears, and so plant the corresponding truths in the mind. Care should be taken, however, not to introduce suggestions of fear which may do permanent harm.

The hypnoid state may be produced artificially. The operator uses the same method as in the induction of hypnosis, but does not allow hypnotic dissociation to supervene. The subject is relaxed, closes his eyes, attends to a monotonous stimulus, and sinks into a passive, drowsy condition. The resulting state of consciousness is intermediate between waking on the one hand and sleep or hypnosis on the other. If the subject is fatigued it naturally tends to pass into sleep; but it may be deepened into true hypnosis if he is hypnotizable. Sidis holds that it is distinct from the lighter stages of hypnosis. Like sleep it has different levels of depth, but whereas the sleep curve rises steadily, the hypnoid consciousness fluctuates from level to level, now sinking into a sea of dreaminess, now

rising toward the threshold of waking. In general "consciousness becomes somewhat vaguer than in the walking condition; memory is more diffused, so that experiences apparently long forgotten come in bits and scraps to the foreground of consciousness. Emotional excitement subsides, voluntary activity is changed to passivity, and suggestions meet with little resistance. The subwaking state is above all a rest-state, a state of physical and mental relaxation." [1]

Sidis holds further that the hypnoidal state is the primordial form of rest, from which sleep and hypnosis have been differentiated as normal and abnormal developments in the course of evolution. It is still the characteristic rest-state of the lower forms of animal life. In man, however, it appears only in a rudimentary way; "it has shrunk to an abortive, transitory, momentary stage in the alternation of waking and sleep." Nevertheless it retains the characteristic function of rest, that of utilizing reserves of energy to repair damage and effect growth.

The therapeutic value of the hypnoidal state, therefore, lies in its combination of this anabolic power with extraordinary suggestibility. Under expert control it serves as a medium for implanting in the mind therapeutic suggestions which receive powerful reënforcement from the stores of reserve energy. Münsterberg observes cautiously that the hypnoid states "offer excellent starting points for the removal of light obsessions and phobias and for the reënforcement of desirable impulses." They are

[1] In *Psychotherapeutics*, by Prince and others, pp. 107, 108.

not less important for therapeutic purposes than the full hypnotic states, especially in view of the popular objections to hypnotism, and the difficulty of inducing it in some patients. Sidis affirms more enthusiastically that "The hypnoidal state helps us to reach the inaccessible regions of dormant energy, it helps to break down inhibitions, liberate reserve energies, and repair the breaches of mental activity. The painful systems became dissociated, disintegrated, and again transformed, reformed, and reintegrated into new systems full of energy and joy of life." [1] The method of giving suggestions is in general like that of hypnotism.

Normal Therapeutic Suggestion.—The methods which we have been discussing imply a more or less abnormal state of mind in the patient. Many facts show clearly that therapeutic suggestion is possible, however, under normal quite as much as under abnormal conditions of consciousness. Not only do drugs take effect by their suggestiveness as well as by their intrinsic qualities; it is equally true that the physician owes his success in considerable part to his "personality," and skill in persistent, strategical cultivation of the idea of health. Likewise quack doctors succeed in some measure through their ability to impart a similar assurance to their dupes, but they fail eventually because they do not possess a sufficiently scientific knowledge of medicine to prevent the recurrence of symptoms, or to lessen the strain which the patient's confidence inevitably suffers through such recurrence.

[1] *Psychotherapeutics*, p. 118.

These truths apply especially to psychotherapy, in which the potential resources of normal suggestion are of the highest order. Nervousness is soothed, obsessions are dispelled, fears are allayed, and impulses are controlled, by implanting appropriate ideas and tendencies to action in the patient's mind, without necessarily resorting to hypnotism, or even to less extreme forms of dissociation. The essential principle of psychotherapy is that of inculcating in the mind of the sufferer the belief that he is going to recover, that he *is* recovering, that the forces which have afflicted him are losing the battle, and that the victory of health is already beginning. This idea, conscious and subconscious, brings mental peace and in cases of bodily disease tends to set at work natural processes of recuperation. Given its presence in the mind, especially in the kind of ailment for which psychotherapeutic treatment is appropriate, improvement follows. Dubois observes emphatically, "The nervous patient is on the path to recovery as soon as he has the conviction that he is going to be cured; he is cured on the day when he believes himself to be cured." [1] The peculiar efficacy of religious psychotherapy in occasional instances is explained by the absolute certainty which religion imparts to the health idea, as to any idea which comes within its scope. With these facts in mind the question presents itself whether it is not in the direction of normal suggestion that scientific development of psychotherapy is most needed.

[1] Dubois, *The Psychic Treatment of Nervous Disorders*, p. 210.

If we enumerate the methods of giving suggestions to the normal consciousness we naturally begin with the simple sort just indicated, namely the cheerful, encouraging presence of the doctor and his prescription of medicines which presumably are beneficial. In this connection we cannot omit certain artifices which are occasionally effective, even though they lack dignity or even are morally questionable. A patient who thinks that he needs medicine may be really helped by flavored pills or liquid doses which have no direct physical efficacy whatever. Psychasthenic huskiness may sometimes be cured by merely thrusting a blunt pointed steel instrument down the throat and manipulating it earnestly while the sufferer chokes. Likewise imaginary lameness may be made to vanish under the genuine or pretended application of electricity, and vague internal pains yield to "magnetic" cinctures and similar devices. Little tricks of one sort and another serve to enhance the suggestive effect of the doctor's personality, for example the exaggeratedly careful mixing of medicine. All this is somewhat contemptible, and in so far as it involves deception it is generally unwise, since eventual discovery is almost inevitable, and the result is not only bad for the patient, but is worse for the doctor's reputation. There is a strong sentiment in the best part of the medical profession that the most expeditious practice in the long run, even in dealing with the nervous and fearful, is frankness and sincerity. Within the limits of the patient's intelligence, and of course his physical and mental safety, honesty is

the best policy. Nevertheless methods of deception sometimes work when others fail.

In many cases of psychoneurotic symptoms relief comes by some form of action, as the suppressed or misdirected energies are drained off through a new and harmless channel. Thus one learns just what to *do* when depressed by worry, or haunted by a psychasthenic image, or coerced by an evil impulse. It is to be observed in this type of case that while the process is fundamentally one of nervous reorganization,—new motor pathways of discharge being broken open by the action,—part of the total effect must be attributed to the suggestion which the action itself impresses on the mind. The motor process of laughing or of praying, for example, carries with it an emotional tone which is antagonistic to the evil symptoms, and the resulting feeling of freedom is an important feature of the cure. Gulick mentions the odd prescription to a nervous dyspeptic, apprehensive about his physical condition, that he tell a funny story at every meal and two extra ones at dinner. The orders were carried out with great difficulty at first. The embarrassed raconteur stumbled and forgot the point of his tale, to the amusement of everybody, including himself. Gradually, however, the performance crowded the "fear-thought" out of his mind. If the action is one which the person had dreaded or had been unable to perform, the suggestive effect is peculiarly happy. We have here a special illustration of the general truth that one's beliefs come largely by way of one's deeds.

Our general definition of suggestion distinguishes it from reasoning and the logical processes of communication, and regards it as essentially mechanical and subconscious in operation. We noted, however, that reasons may have a suggestive effect upon a mind which does not grasp their full meaning; their mere form is impressive though their content remains unclear. This is especially true of children, and also in some degree of older persons, even the highly educated, in dealing with unfamiliar subjects. We all occasionally accept arguments and explanations which we do not understand, and hold their conclusion none the less firmly because we take its grounds on faith. Of course this truth is one of degrees; there may be a more or less clear understanding of reasons together with a suggested appreciation of their force. At one extreme the bare apprehension of the fact that "there's a reason" is sufficient. At the other we have the peculiar efficacy of cogent argument, clearly understood.

"Rational suggestion" in this sense of the term is sometimes a very helpful psychotherapeutic method. Its specific forms range all the way from intelligent assertion of confidence and encouragement through persuasion and argument to a full explanation of the nature of the case and an explicit daily account of its progress. The psychotherapist can undoubtedly produce a marked effect upon the patient by elucidating the cause of his disorder, explaining its symptoms, and analyzing their development from day to day. Clever, persistent argument sometimes goes far to establish in his mind the conscious and

subconscious attitudes which are an indispensable condition of recovery. Dubois, the principal exponent of this method, says, "I cannot too strongly insist on this idea that all 'nervousness' denotes in the subject who is afflicted with it a *mental defect* or a *characteristic lack of logic.*" And further, "It is necessary, then, with nervous patients to know how to get hold of the patient at the start, and inculcate in him the fixed idea that he will get well. It is also necessary to maintain the fixity of this idea until the cure, to lead his conviction by reasons which are always more cogent. In short, in the course of treatment, one must study the mentality of the subject, detect his lack of logic, his exaggerated susceptibility, and, in the daily conversations, modify his natural mentality; for it is to this mentality that one must look for the first cause of the trouble." Dubois' ingenuity in reasoning with his patients, overcoming their objections by argument, and bringing their mental attitude into agreement with his own, is remarkable, and his success is unquestioned. Critics are of the opinion, however, that his "rational psychotherapy" owes its efficacy in large measure to the peculiar force of his personality, for which the reasoning happens to be an appropriate vehicle. In general the rational method needs the additional factor of suggestion, the emotional flavor of authority and assurance which comes through confident manner and tone of voice. Those who use it most effectively are naturally gifted in this respect.

The limitations of the method are found first in

the inscrutability of nervous disorders, which often do not permit such rational certitude. Secondly, we must acknowledge that an imperfect power of argument, an inability to make good reasons seem really cogent, sometimes characterizes excellent scientific minds. In the third place, some nervous diseases incidentally take the form of perverted reasoning, an uncannily keen misuse of logic, against which it is hopelessly futile to argue. In general, the difficulty of discerning precisely the best points of argumentative attack creates a preference for the more mechanical forms of suggestion.

On the other hand, in so far as a nervous affliction involves intellectual error of a perceptual or inferential sort, particularly a wrong estimate or interpretation of symptoms, it appears presumable that the natural corrective may be found at least in part in sound analysis and reasoning. Probably this is true in milder cases, in which the sway of emotion is not too imperious, or the intellectual functions have not suffered too great a derangement. The literature of psychotherapy contains many instances of relief through keen, scientific analysis and explanation of symptoms, a clarification which went far to dispel fear or to constitute a basis for resolute effort. Interesting cases also are recorded of ingenuity in bringing to bear upon a neurosis some reflective consideration on the part of the patient, some emotional belief, some idea of loyalty, and the like, which served to turn the tide of conscious weakness and discouragement into one of buoyant hope and determination.

The greatest need, however, is not for rational suggestions administered by an expert psychotherapist, but rather for a rational prevention of nervous maladies by the individual himself, so that unhealthy tendencies are reflectively checked in their incipiency. Sidis insists strongly that psychoneuroses are not due to heredity so much as to bad environmental conditions and wrong modes of life. If this is true, the proper line of attack is that of prophylaxis. Intelligent persons, especially college students who have the best opportunity for scientific study and practice, ought to learn how to live so as to avoid nervous disorders. Preventive treatment, both rational and suggestive, should be one of the main aims of the future diffusion of the principles of scientific psychotherapy.

Autosuggestion and Reëducation.—It cannot be too strongly emphasized that psychotherapeutic suggestion needs the fullest coöperation of the patient. The idea that it is a quasi-magical power which can be employed successfully against his will is a serious error. Even in the case of hypnotism, where the subject is rendered abnormally suggestible, the effectiveness of the treatment depends upon his faithful acquiescence and efforts to do his part, not only in submitting to the hypnosis, but also under the normal conditions of everyday life. In general, he finds that post-hypnotic suggestion is not perfectly automatic and irresistible. It simply strengthens right tendencies and helps to inhibit evil ones. If he weakly gives way to the impulse of habit or yields on every occasion of temptation, or

worse if he seeks to outwit the psychotherapist by surreptitious self-indulgence, suggestion fails to take full effect and cure becomes practically impossible. Deliberate persistence in the wrong direction constitutes an opposing suggestion too strong to be overcome.[1]

So, too, in the more normal forms of therapeutic suggestion, effectiveness is conditioned upon thoroughgoing coöperation. This implies more than an initial desire, however strong, to get rid of the neurosis. It calls further for the steady and sturdy maintenance of this attitude as an underlying force of daily life. Innumerable cases fail of recovery simply because the patient found it easy to slide into the old grooves of habit, and leave responsibility to the physician. But the latter, though able to deal skilfully with the mechanical aspects of the case, could not overcome by suggestion the opposition of the subject's own will. The cumulative suggestiveness of frequent lapses, and still more the basic, subconscious resistance, served to render his efforts futile.

Even where there is an honest and persistent determination to do right, there are subtle factors of failure which are not easily avoided. These are likely to be especially prevalent in autosuggestive treatment. Many persons have undertaken with all earnestness to eliminate some demon of worry or of

[1] Münsterberg mentions the instance of a young man who was brought to him for hypnotic treatment for alcoholism. The case did not progress satisfactorily. He soon discovered that the patient, though carefully protected and watched, had nevertheless succeeded in obtaining liquor by bribing a chambermaid to bring it concealed in the laundry. He promptly dropped the case.

moral weakness from their lives by methodical autosuggestion. But though they tried zealously they failed. Perhaps the explanation of such failure is found most commonly in the conscious and subconscious acknowledgment of the tremendous difficulty of the matter, and the consequent mental and physical tension, conditions which of course are exceedingly unfavorable for the implanting of the needed suggestions. Feeling his own responsibility, the individual makes strenuous efforts, but his very strenuousness in repeating his suggestive formulas carries with it a subtle antagonistic suggestion. Subconsciously he is admitting to himself that the enemy is almost if not quite too powerful to be overcome. One may try so hard to go to sleep by energetic application of somnolent suggestions that sleep becomes impossible. It is an interesting psychological principle, demonstrable by laboratory experiment, that an intensely negative command tends to exercise a positive force in the very direction which it prohibits. Experts say that one of the hardest parts of the process of autosuggestion is the attainment of proper mental and physical relaxation, a relaxation which is not mere flabbiness or mind wandering, but has its own quiet determination and inflexible purpose.

Probably the greatest difficulty with which the autosuggestionist has to contend is the feeling that he is trying to deceive himself. He solemnly tells himself in set phrases that he has conquered, that he has expelled his enemy, that temptation has lost its power, and that never again will he fall before it—

and all the while he is subconsciously aware that this is not so. He is fooling himself and he knows it. Even though his knowledge remains at a subconscious level it acts to inhibit the force of his explicit declaration. Hence the particular form of the suggestion becomes a matter of great significance. The right kind of suggestion is that which reënforces appropriate tendencies of the subject's character and does not claim too much. The confident assertion that one is *beginning* to acquire self-control, is *gaining* in the process, that the trouble is *less* than it was, and so on, has a better chance to take effect than do more unqualified assurances. The problem of finding the precise ideas which are most in harmony with the better tendencies of nature and training and which will meet with least resistance is far more difficult than the popular understanding of autosuggestion recognizes. For rationally minded persons a good deal of preliminary deliberation is requisite.

Finally, the methods of therapeutic suggestion cannot fairly be expected to take quick effect. That which they seek to eradicate is usually deep rooted and of long standing, so firmly embedded in the character that only a correspondingly protracted course of treatment can remove it. Not days but weeks and months may be necessary to alter permanently the balance of forces. Sometimes there must be a real "reëducation" of mind and body before the persistent emotion or settled habit gives way. In such cases the process is that of piling suggestion upon suggestion, each adding to the total

weight, until the affective center of gravity is in the right place, so to speak, and the active bent is in the right direction. The more pertinaciously one practises this reëducation, the more enduring is the result.

QUESTIONS AND EXERCISES

1. What early connection did hypnotism have with medical practice?
2. Why has the attitude of the medical profession toward hypnotism generally been unfavorable?
3. What are the principal uses of hypnotism for medical purposes?
4. How is hypnotism used in treating psychoneurotic disorders? Mention an illustration of the kind of disorder to which it is especially applicable, and indicate if possible the kind of suggestions which you think would be appropriate.
5. What possible use does hypnotism have in relation to bodily disease?
6. What limitations and dangers are there in the use of hypnotism for medical purposes?
7. What are the "hypnoid" states? How do they differ from hypnosis?
8. Why are hypnoid states especially useful for psychotherapeutic purposes? In what respects are they preferable to hypnosis?
9. Describe "hypnagogic autosuggestion," using as an illustration a case of chronic bad temper.
10. What is "normal therapeutic suggestion"? Show how it is illustrated by ordinary medical practice, by "medical quackery," and by religious psychotherapy.
11. Show by illustration how a special form of deliberate activity may have psychotherapeutic effect in counteracting neurotic symptoms, e.g., in a case of habitual worry.
12. Show how rational explanation and assurance may possess therapeutic value. What are the limitations of this method?

13. Explain the assertion that rational methods are more important for prevention than for cure. Show that this principle applies especially to childhood.

14. What is meant by the "coöperation of the patient" in therapeutic suggestion? Show why the lack of coöperation results in failure of the treatment.

15. What are the principal difficulties in the process of autosuggestion? Show how these may be overcome by perfecting the technique of suggestion.

16. What is "reëducation"? Give an illustration of some personal trait which seems to you to need reëducational treatment.

CHAPTER XIII

PSYCHOANALYSIS

The Causation of Mental Disorder.—The most important contemporary development of psychotherapy is the theory and practice of "psychoanalysis." The basic principle of this remarkable method is that mental disorders are caused by the subconscious pressure of an interest—instinctive tendency, persistent impulse, or deep emotion—which strives for expression against internal forces of opposition. Some early experience of fright or passion, it may be, some painful disappointment or frustrated desire, still lurks and festers in the depths of the mind, manifesting itself in the odd and apparently unaccountable ways which are the psychoneurotic symptoms. The unpleasant source of the trouble may be more or less clearly remembered, or it may be forgotten or deliberately suppressed. Often it lies so concealed in the individual's subconsciousness that only by the most technical and expert devices can it be brought to light. Yet brought to light it must be before there can be permanent relief.

It is noteworthy that psychoanalysis illustrates the general scientific advance of medicine in that it lays emphasis upon *the fundamental importance of correct diagnosis.* Instead of proceeding from a

hasty survey of a disorder and a vague classification of its general character to treatment by a stereotyped method, it seeks first to determine the precise cause of the symptoms, maintaining that not until this is detected can the remedy be intelligently prescribed. In this diagnostic analysis individual peculiarities count for quite as much as the more general and typical symptoms; indeed the method consists to a large extent of ascertaining the significance of what is commonly overlooked. For example the exact words of a patient's casual conversation about any topic, or a bit of seemingly insignificant behavior, may prove to indicate in its own subtle fashion some peculiarly personal fact of his past experience which is the root of the difficulty. Whether or not the actual diagnoses of psychoanalytic specialists in particular cases are sound, there can be no question that the point of view or method of approach which is directed at the discovery of the causal factors is the correct one.

Psychoanalysis as a psychological theory and technical method of psychotherapy originated with Sigmund Freud, a Viennese psychopathologist, whose classic investigations in the subject were first published in 1895. His professional experience convinced him that the arch factor in hysteria and other nervous disorders is a desire, usually an impulse or emotion of sexual character, which has been repressed by forces of education and social conventionality, but which remains alive and powerful in unconscious form. This active "wish" of the life force or "libido," connects itself closely

with other details of the mental life, and is thus enabled to express itself indirectly as the appearance of these details in the stream of consciousness. In this way a casual remark or action, a lapse of memory, a flash of mental imagery, and especially a dream, may prove to be symptomatic of an underlying repression. The phenomena of sex interest were interpreted broadly, and included not only the reproductive instinct, but all emotional and impulsive relations having reference to sex. Other instinctive tendencies were acknowledged to operate occasionally in the same way, but the principal factors of psychoneuroses were found by Freud to be distinctly sexual. The fact that sex instinct is deep and strong, and that it has been subjected to all sorts of restraint by civilization, lent color to this aspect of the theory and made it as fascinating to some minds as it is repulsive to others.

Freud regarded the repressive forces as constituting a mental entity, which he termed the "censor," whose function it is to prevent objectionable wishes from becoming conscious. The repression may be so complete as to constitute amnesia, or systematic forgetfulness of the matter. Nevertheless the excluded tendency finds its own shrewd ways of evasion. The associated mental and physical processes through which it discharges itself are "symbols" of it; they have a hidden significance, and thus permit the desire to appear, as it were, in disguise. The evasion, however, is frequently at the cost of a considerable degree of dissociation, such as a troublesome mental image the meaning of which

the patient cannot fathom, or a muscular automatism which he cannot control. The repressed interest may even attain so elaborate a complexity that it sets itself up independently as an alternating or concurrent personality, with its own systematic content of selfhood. In a general way we may understand the behavior of the disordered mind to be an effort to escape from the real world of its environment, the hard, repressive actualities of experience working through its own intelligent self-consciousness, to a fanciful or ideal world of its own devising, an easier, happier world where its desires are gratified.

Thus are created the psychoneurotic symptoms, and accordingly the psychoanalyst's primary task is that of discovering and interpreting these symptoms so as to reveal their underlying cause. This is a technical and difficult process, and it may take weeks or months before the significant details are collected and their secret meaning is brought to light. Here enter the variegated doctrines of symbolism which characterize Freudian theory. Some symbols are individual peculiarities; others are common human fancies which have descended to us through innumerable centuries. Not a few possess the mystical quality of suggesting vaguely something other than themselves, something too important to be otherwise expressed. Many appear to be automatic actions symbolic of self-defence, or attempted "compensations" for a felt inferiority. Some carry a burden of mysterious sorrow, and some are as obvious in their significance as the neurasthenic habit of dwelling in

a world of its own imagination, where it satisfies its desires, attains distinction, and triumphs over its enemies. The precise methods of analysis by which the investigator proceeds in ascertaining the cause of the symptoms, and also the methods by which, when he has found this cause, he terminates the repression and thus brings relief to the sufferer, we shall consider subsequently.

Psychoanalytic theory has shown its vitality not only by securing widespread professional acceptance, but also by its inner development. Eminent psychopathologists have adopted the fundamental principles of Freudianism, but have recast these with shiftings of emphasis determined by their own professional experience and reflective thought. Some are inclined to follow Jung in avoiding the identification of the libido with sex instinct as completely as do the more orthodox Freudians, and holding the life force to be more varied in its major operations. For them the psychoneurotic phenomena are understood less as the effort of the individual to return to the primitive sexuality of childhood than as a striving forward to larger experience. They also emphasize especially the predominant influence of parents in determining by their behavior the mental life of the child and thus its later life as well.

Another tendency, and a very energetic one, is that represented by Adler, who finds the keynote of unconscious striving to be less the sex wish than the desire for safety and power. Any physical or mental inferiority tends to concentrate the functions of the mind in an effort to obtain protection and en-

largement of the self. Thus great achievements sometimes rise from the most unpromising conditions; and thus the neuropaths and psychopaths endeavor to defend or to glorify themselves in queer ways, their motives, of course, being rooted in the unconscious depths of the mind. Many of the most plausible psychoanalytic interpretations are of this character. It may be questioned, indeed, whether the center of gravity of Freudian psychology is not shifting from sex motivation, Freud to the contrary notwithstanding, to the instincts and emotions of self-assertion, operating in various ways.

Certain specialists in Freudianism seek to relate its psychological principles to the facts of biological and physiological science, and thus to establish the psychoanalytic structure on a firm basis. For this purpose the known functions of the endocrine glands and the regulating mechanism of the autonomic nervous system, processes which underlie the instinctive and emotional life, offer promising points of departure. The effort remains largely speculative, however. More illuminating is the eclectic acceptance of the sounder, more empirical part of Freudian doctrine and the restatement of it in accordance with contemporary psychological science. Here the work of Morton Prince is especially noteworthy. These various tendencies cross and recross, but their theoretical background remains substantially the same—the concept of an unconscious or subconscious mind, whose vital energy defies repression of its desires, and ingeniously finds peculiar outlets for them in consciousness and behavior.

The fuller expositions of the theory involve numerous technicalities concerning varieties of complex, forms of symbolism, "mechanisms" of mental action, and types of personal character. These details lie beyond our present purpose. Instead let us observe a few typical illustrations of psychoneuroses which may be interpreted as the effect of subconscious motives.

Coriat tells of a young woman who "for a number of years had suffered from peculiar attacks consisting of headache, palpitation of the heart, and twitching of both arms, particularly the left arm. . . . The attacks are said to have followed an emotional experience when the patient was eight years of age, a fright at seeing her cousin disguised in white to resemble a ghost. While the patient had heard of this experience in general, she has never been able to recall it in detail." There were also numerous and varied other symptoms, both physical and mental, which indicated a disintegration of personality, and suggested that an emotional experience had become subconscious and was operating independently, as though in an effort to escape from its cause. This was later shown by methods of psychoanalysis to be the fact.[1]

One of Freud's patients was an English governess in an Austrian family, who complained of "a persistent hallucinatory odor of burnt pudding." Examination of the case revealed the fact that her fondness for the motherless children in her care had resulted in her falling in love with their father, a

[1] Coriat, *Abnormal Psychology*. 2d ed., pp. 229 ff.

state of mind which she had repressed. On one occasion when she was playing with the children some pudding on the stove had burned, and its odor, knit up with the experience by association, thereafter "represented a moment when some obscure scruple had urged her to leave the children because of something dimly felt to be wrong in her attitude toward their father." A second hallucination in the same case was that of the smell of cigar smoke. This was psychoanalytically traced to a painful scene, involving the children, in which the men present were smoking.[1]

Prince describes an interesting case of a patient who had been enduring severe nervous strain, and who happened to have a desire to do original work in psychology. His hypnotic suggestion to her that she would have a "wish-fulfillment" dream was realized. The dream was a long one, and contained explicit references to the distressing circumstances of her life and the problem to which they gave rise, together with an allegorical solution of the problem. She dreamed that she was participating in the building of a large temple by carrying stones to a certain part of it. The stones were heavy and sharp, and they made her hands bleed. At length the builder told her to build a temple of her own, and with self-distrust relieved by his help she proceeded to do so. "So I began to build the stones I had taken him. It was hard work, but I kept on, and a most beautiful temple grew up. . . . All the stones were very brilliant in color, but each one was stained with a drop

[1] Recounted by Bruce, *Scientific Mental Healing*, pp. 95 ff.

of blood which came from a wound in my heart. The dream ended with a beautiful angelic figure bearing the word "Hope" on his forehead, who "spread his lovely wings and rose right up through the temple and became the top of the spire, a gorgeous shining figure of Hope." Psychoanalysis by the method of associative memory showed, in Prince's words, that "Every one of the dream-elements (temple, spires, foundations, stones, bleeding hands, drop of blood from the wound in her heart, etc.) . . . were symbolisms of past experiences or of constructive imagination." [1]

Pierce recounts the case of a man of neurotic constitution who suffered a strange hysterical paralysis of his arm. The condition followed a domestic quarrel in which his wife upbraided him for having beaten his son. The next morning he woke to find his right arm apparently paralyzed with the forearm across the small of his back. Psychoanalysis brought to light the fact that in his own childhood he had beaten his younger brother and that his mother had punished him by tying his arm behind his back and keeping it in this position for seven days. According to psychoanalytic theory the paralysis expressed a guilty conscience, and symbolized a desire to atone for his cruelty to his child, motive forces which he suppressed but which thus found satisfaction.[2]

Methods of Psychoanalysis.—The problem of the psychoanalyst is that of discovering the hidden

[1] Prince, *The Unconscious*, pp. 197 ff.
[2] Pierce, *Our Unconscious Mind*, pp. 15 ff.

causes of the symptoms. In some cases this is easily done. The originating experience may have been neither remote in time nor shameful in character; and the patient, who may not have understood its relation to his troubles, finds no great difficulty in telling of it in a way which reveals this connection. The process of association, working under favorable conditions, leads directly to the source of the neurotic symptoms. Thus one of the writer's acquaintances, taking counsel concerning a constant nervous tension which interfered seriously with her musical practice, presently found herself speaking of the blow which she had experienced in learning that her fiancé had suffered a permanent mental injury through shell shock. That this was at least partially the cause of her nervousness was shown by the relief which she felt upon telling of her sorrow. Many an opportunity for such simple and helpful inquiry is removed only by a varying range of difficulty and technical method from the pathologist's typical case of psychoanalysis.

Where there is a considerable degree of repression or a baffling amnesia the psychoanalyst uses various devices in order to penetrate to the source of the symptoms. First, the method of hypnotism may serve to recall a lost memory and thus reveal the center of an obnoxious complex. In the case of Coriat's, described above, the young woman could not normally remember the ghostly apparition, but was enabled by hypnosis to review the details in the most vivid manner. Freud and his more orthodox followers, however, are inclined to reject hypnosis as

inadequate and unreliable. Some patients are not easily hypnotized, some have a strong objection to the process, and in any case there is danger that the subject's hypnotic statement will be colored by suggestions given unintentionally but almost inevitably by the hypnotist. Better results are obtained by using hypnoid states which preserve a greater degree of spontaneity on the part of the patient. By this method the latter relaxes into a dreamy condition and describes whatever imagery passes through his mind. If he refrains from direction or inhibition of his mental processes his speech gradually reveals the suppressed memory or emotion. At first, perhaps, he utters only mere detached words or phrases, but at length the stream swells into complete sentences and continued discourse until it brings the complex to the surface. Some training is ordinarily requisite in order to accomplish this, since the self, if it is accustomed to repressing the idea in question, does not readily withdraw its inhibitions. Accordingly the subject is instructed and encouraged to talk without purpose or self-restraint, simply presenting whatever appears on the mental screen. If the investigator has a clue he can suggestively direct the procedure, and verify diagnosis by the nature of the responses elicited. To distinguish, however, between the genuine expression of a suppressed complex and a mere reflection of a suggestion, requires skilled judgment. It is possible unintentionally to suggest an unreal difficulty, and then to extract fictitious evidence of its existence.

Dreams also furnish valuable material for psy-

choanalysis. Here again some training is necessary since our dreams ordinarily vanish irrecoverably upon waking. With practice, however, one can preserve their details; and these apparently meaningless and fantastic mental pictures may prove to be highly significant. For all dreams are compounded of interests and memories according to the principles of association, and in a much more regular way than appears at first sight. Their content is derived from experience, frequently from recent experience, and is transformed into a more or less explicit or symbolic expression of some desire or emotion. In the case of a person who has a suppressed wish, therefore, the dream may be nature's way of relieving the strain of the suppression; and the odd performances of the dream life, when rightly understood, may reveal the hidden source of the trouble. Freud maintains that the unconscious purpose underlying the dream works itself out in the dream content according to certain typical processes or "mechanisms" which he terms "condensation," "displacement," "dramatization," and "secondary elaboration." Without going into the exposition of these technicalities we may note that they serve to rationalize many dream figures and occurrences which seem at first glance utterly absurd and meaningless. Of course in so far as the content of the dream is "symbolic" in this very complicated way, the interpretation of it properly becomes a highly expert piece of work. Just what the dream signifies is often a dark problem, the elucidation of which by amateur psychoanalysts may be sheer fiction. On the other

hand the symbolic significance may be unmistakable, as in the case of the temple-building described above.

A certain form of the "association method" described in Chapter V is occasionally useful as a means of unravelling the mental tangle which lies at the root of puzzling psychoneurotic symptoms. The analyst or an assistant pronounces a series of words, to each of which the subject replies with the first word which comes to mind. If the stimulus word happens to be related to the complex either the response word itself or the number of seconds taken to produce it may be significant. The list of words ordinarily employed, with more or less modification to fit the needs of special cases, is that prepared by Jung for use in the Clinic of Psychiatry at Zurich. It contains one hundred words, and includes, along with names of familiar objects, common actions and the like, several words which are especially likely to touch the hidden sore spot. Most nervous disorders have their causes in one or another of a few broad departments of life,—disease, money and business affairs, sex and domestic relations, morals and religion. Accordingly the responses to "cue" words referring to these matters serve as ravelling points of complexes. The patient who replies to "money" with "loss" or "stolen," or who hesitates perceptibly before responding to "sick" or "marry" or "lie," gives a clue which the trained investigator can follow with skilful pertinacity. Since the average association time ranges from less than a second to about two seconds and a half, depending on the familiarity of the word in question, it is evident that

a lapse of several seconds indicates conscious or subconscious inhibitions. Significant also may be the lengthened reaction to the word following, the repetition of the cue word, display of surprise at the latter, or the reactions of trembling and blushing. Reaction times are measured accurately with the chronoscope. Other instruments of the psychological laboratory, the sphygmograph and the plethysmograph, which record changes in pulse and in breathing, may also be used to ascertain whether a particular word touches a complex. Slips of speech, accidents of clumsiness, mannerisms and bits of unusual behavior may likewise have serious import to the discerning mind of the trained observer.

The mental analysis of psychopathic disorders is to be regarded distinctly as a task for the expert technician, requiring thorough grounding in physiology and psychology as well as special knowledge of Freudian theory and practical method. Obstinate cases need protracted observation over months. While the general principles may throw a speedy and helpful light on the milder and less settled affliction of the mind, it is expressly to be noted that psychoanalysts are not properly made, as unfortunately too many are improperly made, by a superficial reading of Freudian literature and a large amount of self-assurance. Society is in danger from a new form of pseudo-psychological quackery, which can ultimately be avoided only by the dissemination of genuine scientific knowledge and practice.

We may appropriately conclude this section with the following brief account of the psychoanalysis of

a case of dementia præcox.[1] "The patient was an intelligent young woman, thirty years of age. At the age of twenty-eight she went on a pleasure trip, and during her travels, she consulted three palmists who informed her that while on this trip she would meet the person who would eventually become her husband, although there would be considerable trouble and delay. To a certain extent this occupied her mind and worried her, and while on her way home she became acquainted with a young professional man. Shortly afterward she began to have a series of dreams, such as the hearing of pistol shots, of a certain person wearing a black necktie, at another time of a police officer about to arrest her, that her father and mother were in prison for some terrible crime. Later other dreams followed, such as being on a sinking ship or in a rowboat alone at night, or of traveling interminable distances on a railroad train. These dreams symbolized certain things to the patient; the dream of the black necktie meaning that the professional man had committed suicide, the sinking ship meant trouble, the rowboat signified her destiny. Finally peculiar words that she had been unaccustomed to using would suddenly flash into her mind, such as 'tripod,' 'harlequin,' 'suicide,' 'Jezebel,' 'ineffable woe,' 'ineffable joy,' etc. To these words a symbolic meaning was also attached. Finally these words became hallucinatory in character and took the form of voices, and the patient became literally bombarded by auditory hallucinations. In the series of associations which

[1] Coriat, *Abnormal Psychology*, pp. 94 ff.

follow it will be noticed that long reaction times coincide with the words or ideas which formed either the complexes, the hallucinatory phenomena, the dreams, or the previous experiences.

Stimulus Word	*Reaction Word*	*Reaction Time (Seconds)*	*Stimulus Word*	*Reaction Word*	*Reaction Time (Seconds)*
Chair	Frame	4.8	Affinity	Like	4.2
Tripod	Three	2.2	Ring	Round	2.8
Glass	Square	2.8	Book	Vellum	2.6
Black	Darkness	4.	Police	Uniform	3.4
House	Home	1.8	Jezebel	Wickedness	4.8
Harlequin	Fool	6.4	Dress	Gown	3.8
Ship	Ship	4.	Prison	Bars	8.
Heart	Red	6.2	Joy	Happiness	2.8

The slowness of reaction showed that the emotions aroused by certain test words were blocked, and could not easily find a normal path of discharge. This was due to the fact that the test words aroused painful memories in the experiences of the subject, such as certain incidents in her life, her dreams, and her hallucinations and delusions. For instance such words as 'prison,' 'black,' or 'ship' referred to the dreams and their symbolic interpretation; 'harlequin' and 'Jezebel' referred to the hallucinations. In this case also, the same test words caused an increase of the pulse rate."

Psychotherapeutic Treatment.—The discovery of the source of the symptoms does not necessarily constitute a cure of the disorder. The fundamental advantage of the psychoanalytic method, as was pointed out at the beginning of this chapter, lies in the fact that it goes to the root of the trouble instead

of laboring with its effects while leaving their persistent cause untouched. From the standpoint of psychoanalysis the latter method reveals its own defectiveness in that the symptoms often prove recurrent after a longer or shorter period of relief. The real aim of psychotherapy, therefore, should be the extirpation of the root.

This is accomplished in various ways, all of which involve the general principle that a deep emotion or desire cannot be killed by direct opposition, but may be removed by indirect methods, or controlled so that it becomes harmless. The patient must not fight against it; in fact such antagonism and struggle to suppress it is the very cause of its insidious power. Hence further opposition can only increase the evil. Rather must he find ways of letting it exhaust itself innocuously, so that it no longer seeks expression in the disagreeable symptoms. The mind's own mechanism completes the cure.

In some cases all that is needed is a "mental catharsis" or full exposure of the original experience. The latter made trouble because it possessed a vitality which would not submit to repression but demanded an outlet. Confession, which is traditionally good for the soul, affords such an outlet. The fear or shame or bad impulse loses its power when restraint upon speech is released. The subconscious energies are discharged through motor channels of words and gestures, and relief follows. Having "got it off his mind" in this way the person goes about his business with a sense of freedom. And if he is made to feel that it will always be possible to talk the

matter over frankly with the physician, or even with himself, there is no further need of "symbolisms"; in other words it is unlikely that the neurotic or psychopathic symptoms will recur. Similarly a suppressed tendency may be given some peculiar form of expression which happens to be appropriate, —a cry of grief, a flood of tears, the writing of a letter, or other performance. Obtaining thus a normal motor discharge, it loses its subtle pertinacity in seeking an outlet. Strangely enough in cases in which such expression is unsafe or improper the mere permission, "If you feel that way, go ahead" may prove a sufficient relief even though it is not carried into effect. James mentions a student who felt a strong impulse to throw himself from a window in imitation of another student who had committed suicide in this way. "Being a Catholic, he told his director, who said, 'All right! if you must, you must,' and added, 'Go ahead and do it,' thereby instantly quenching his desire. This director knew how to minister to a mind diseased."

Often when a troublesome experience is consciously recalled after a long interval it is seen in a new light. The frightful thing is no longer frightful, or the shame is seen to be unnecessary. This is especially true of the numerous disorders which have their origin in childhood experiences, or before the individual gained his full power of intelligent valuation. In any case the frank discussion of a complex may serve to reveal its foolish or undesirable character, and to bring to bear upon it new forces of personality which automatically displace it. A

covert desire for revenge, for example, loses its illusory enticement when clarified by reason and common sense. Since the character of an emotion depends in some measure upon the intellectual apprehension of the stimulus, permanent relief may come simply through taking the right view of a matter.

The foregoing methods shade by degrees into those which seek to "side-track" the repressed emotion or impulses by turning it in another direction, or to "sublimate" it by connecting it with some ideal interest, and so reintegrate it in a unified personality. As an illustration of side-tracking we may note the case, described by Münsterberg, of a man who suffered from a tendency to hesitate in walking on the street, especially when he looked down at the pavement. This difficulty was traced to an experience in which he had almost fallen into a hole when running to catch a street car. He was cured by being put into a hypnoid state and told to repeat the occurrence in imagination, but on reaching the hole to jump over it. After doing this on ten successive days the hesitancy on the street disappeared.

Psychoanalysts lay stress upon the importance of "sublimating" an undesirable tendency by substituting an ideal form of expression for its natural one. This may take place through some accomplishment in art or letters, or the prosecution of social or religious interests. According to the theory in its larger aspects the historical evolution of culture is an elaborate sublimation of repressed sex instincts and other tendencies of human nature. More specifically,

the central factor of a complex may be given some peculiarly appropriate expression, for example, the piece of psychological work which Prince's patient was advised to undertake. It is a familiar fact that ungratified parental instincts are sublimated by the adoption of children or in the profession of teaching. A wise psychologist of the writer's acquaintance advised a young college woman whose engagement had been tragically broken to find some younger student who needed intelligent assistance and to devote herself assiduously to this purpose. The emotion attendant upon any hard blow or deep disappointment is sometimes worked into a positive form which ennobles the performance of duty,—as though the sufferer said from the depths of his soul, There shall be no frustration or disappointment in this deed which expresses my true self! Likewise the ambition to overcome conscious inferiority in the struggle of life occasionally gains satisfaction in self-sacrificing service, a mode of expression infinitely superior to the neurasthenic "defence mechanisms" which are so natural to the helpless.

Evidently the principle of sublimation is an ancient one, long practised by those who are wise in the ways of the mind, and certainly long antedating the theory of psychoanalysis. Only our scientific appreciation of its method of operation is new. To discover the obscure cause of a mental disorder, and then remove the latter by giving its cause an appropriate form of expression is no small achievement, however. The last and not the least word of psychoanalytic theory is scientifically in agreement with

the wisdom of the ages, and is at the same time an extension of its power.

Criticisms.—Psychoanalysis has attained extraordinary vogue both among specialists in nervous diseases and also with the psychologically interested public. Many regard it as the most brilliant discovery in the history of psychotherapy, or at least second only to hypnotism. The more enthusiastic of its votaries believe that it properly relegates to a past epoch all other psychotherapeutic theories and methods, if not all preceding forms of psychological explanation. Large and small volumes are continually appearing, and promulgating in technical or in popular form its statements of principle and records of practice. Its diagnostic and curative success in an ever increasing number of well authenticated cases compel respect and win adherents. And finally, its varied application to art, literature, history, sociology, education, morals, and religion, give it an impressive encyclopedic dignity.

Nevertheless certain criticisms which are directed against it deserve recognition. We need only mention very briefly those which were specified in an earlier chapter with regard to the general theory of psychoanalysis, and which apply to its therapeutic aspect as well. The "Unconscious Mind" is not a scientific concept, and it should be replaced by a more empirically constructed one. The known types of marginal and dissociated mental process, together with the structure and function of the nervous system, provide a satisfactory basis for the system without making excursions into the realm of dubious

metaphysics. Further, the supreme importance attached to sex interest does not fairly represent human nature, and is easily exaggerated in the psychopathologist's own field. It has been much relieved in the later developments of the theory, as we have seen, by the recognition of other powerful motives. The alleged symbolisms, also, are in many instances purely imaginary. Psychoanalysis assumes rather than proves the symbolic significance of the facts of behavior, as is shown by the possibility of different interpretations. To take a single illustration, a dream of flying may not be indicative of any particular repressed desire, may not symbolize sex interest in any respect whatever, and certainly does not demonstrate the existence of an unconscious mind. Such criticisms do not, of course, entirely invalidate Freudianism, but they unquestionably call for appropriate modifications of the theory.

In addition we may mention other criticisms of a more distinctly practical sort. One is that the analysis of psychoneuroses may be extremely harmful to the patient. The leading psychoanalysts themselves, by the way, are emphatic on this point, and the opinion of critics is quite in agreement. Rummaging around in a disordered mind, especially under conditions of mental strain in a therapeutic consultation, may produce complications worse than the original difficulty. When we remember that the pronouncement of a physician, even of a quack, is usually taken by the patient as authoritative, and that the latter finds it easy to brood over a fancied ailment, especially if it is an obscure one, we see the

baleful potency of the process. The effect may be that of suggesting to the sufferer, whose state of mind borders on hypnotic suggestibility, that he has a mental affliction which refuses to depart. It is quite possible for the analyst to create by his inquiry an emotional tangle resembling a complex, which he proceeds triumphantly to find.

Another grave danger exists in the possibility of misusing information obtained by psychoanalytic methods. These call for a complete unburdening of the mind with regard to matters which are ordinarily kept strictly to oneself, actually disgraceful experiences and habits, it may be, or merely such inclinations, thoughts, and dreams as are denied open expression by good taste or social conventionality. Obviously if the practitioner is unscrupulous he can extract confessions which the patient would be exceedingly unwilling to have known by his family or associates, and can then extort money under threat of exposure. Cases of this sort have occurred, leading in some instances to domestic tragedies or to action in the courts, and they show clearly the peril which lies in moral unreliability on the part of the psychoanalyst.

Finally, we need to be cautious in accepting the credentials of actual performance. Unquestionably the practice of psychoanalysis is successful in considerable measure, but here as elsewhere in the field of medicine failures are less advertised than are successes, though they may be equally important in the evaluation of the method. There is also a great deal of solemn pretence of accomplishment which is really

hollow. Every psychotherapeutic theory can boast of its cures, but in many cases the cures are the effect, not of the theory as applied to the disorder, but of more general influences of suggestion of authority, of confidence, of hope, which are the common property and instruments of the medical profession.

An occasional by-product of the theory, in minds which have a tendency to neurosis, is the suspicion that one is afflicted with a harmful complex. This line of reflection is of course to be avoided. There is no doubt that everybody has complexes in the sense that past experiences continue to form associations in the mind, and to affect life vitally in subtle and indirect ways. This truth need not cause alarm, though the full appreciation of it imparts solemnity to life. Complexes of the kind magnified by Freudian psychology are the exception rather than the rule.

QUESTIONS AND EXERCISES

1. State the fundamental principle of psychoanalytic theory as applied to the field of psychotherapy. Show how its view of the nature of the symptoms of mental disorder differs from that of other psychotherapeutic theory.

2. Explain the assertion that psychoanalysis lays special emphasis upon the importance of correct diagnosis.

3. State the meaning of the following terms: libido, wish, repression, censor, complex, symbol.

4. Give illustrations of neurasthenic behavior which may be interpreted as a mechanism of self-defence. As a "compensation" for a subconscious sense of inferiority.

5. What lines of inner development has psychoanalytic theory shown?

6. What special methods of psychoanalysis are used to dis-

cover the cause of mental disorder? What is the objection to hypnotic methods?

7. Why are dreams especially useful for psychoanalytic purposes?

8. How is the "association method" used in psychoanalysis? What principal kinds of subconscious trouble are reached by "cue words"?

9. What are the principal methods of cure to which psychoanalysis leads? Show that they rest on the same fundamental principle.

10. What is "mental catharsis"? Why does it tend to put an end to the neurotic symptoms?

11. Give illustrations of "side-tracking" and "sublimation."

12. Show how grief produced by death may appropriately be given both catharsis and sublimation.

13. What sublimations of sex instinct do we find in civilized society?

14. State briefly the principal criticisms of psychoanalysis.

15. What special dangers are there in the popularization of the theory?

CHAPTER XIV

RELIGIOUS PSYCHOTHERAPY

General Character of Religious Psychotherapy.—The healing of disease has always been a religious function. Sickness and health, like other vitally important matters, were supposed in the early culture of mankind to be dependent on mysterious, supernormal agencies; and accordingly the treatment of disease belonged to persons who sustained a peculiarly intimate relation to these agencies, i.e., to magicians, medicine-men, witch-doctors, priests and other holy persons, while various material things such as trees, stones, pools, and artificial objects served as the bearers of power to put to flight the dread forces of disease. Relics of saints were especially effective. Special religious ceremonies, ranging from simple prayer and "laying on hands" to elaborate ritualistic performances, were instrumental in securing divine favor.

This early point of view persisted with the advance of culture, sometimes purified and spiritualized in its conceptions, sometimes exhibiting its original crudity and superstition, but always presupposing that sickness is an affliction of the soul as well as of the body, that it is in some degree a consequence of untoward spiritual influences, either the

malice of devils or the sin or ignorance of the sufferer, and that it can be terminated by restoring certain spiritual conditions. The demon must be exorcized, the sin expiated by sacrifice, the ignorance removed by enlightenment. The development of modern science, and particularly the scientific study and treatment of disease, did not abolish this view, which remains essentially unchanged in the minds of many persons. Religious therapy continued side by side with scientific practice, occasionally borrowing or lending aid, sometimes sharply antagonistic, but always manifesting original and independent power.

Its forms in the history of human culture have been numerous and diverse. Like other phenomena of religion they have usually originated or centered in the religiously gifted persons, whose power of relieving suffering and healing sickness has attracted attention. Most of the great founders of religions, e.g., Buddha, Mohammed, and Jesus, have incidentally been healers. In some instances special sects and communities with a high degree of religious organization have arisen from this root. Zion City, founded by John Alexander Dowie, and Christian Science are conspicuous contemporary examples. The types differ not only in point of organization, but in varying emphasis upon Biblical traditions, philosophical principles, and scientific psychology. For some the cardinal fact is the "miracle of healing," the historical verity of which is assumed, and which is believed to need only faith for repetition at the present time. These are intellectually the simplest forms; they call for no precise knowledge of

the nature of disease, or rational grasp of the forces by which healing is effected. Faith in God's power is sufficient. Dowieism and the sporadic performances of "divine healers" are of this type. Others, particularly New Thought and Christian Science, possess a metaphysical basis, a set of profound principles, the understanding of which is requisite in order to conquer disease and attain health. The Emmanuel Movement illustrates a less numerous type which seeks to add the resources of religious faith to the knowledge of the medical scientist, and thus obtain what neither form of therapy can accomplish independently.

Corresponding to these differences of intellectual caliber runs a diminishing range of application. For the simpler forms all diseases are essentially alike in their susceptibility to religious cure; and the same methods of treatment apply to all. The more reflective and intellectually developed forms observe distinctions among diseases, and even in some cases, such as broken bones and virulent infections, acknowledge their own helplessness or place main reliance upon medical and surgical science.

Religious psychotherapy is not mere superstition. It actually works. Students of the subject who are not adherents of psychotherapeutic cults, and are scientifically unprejudiced in the matter, are increasingly inclined to acknowledge the effectiveness of a religious point of view and an atmosphere of religious faith in the treatment of disease. How reliable the method is, and how extensive its success, are further questions, but we cannot dismiss the

whole matter after the easy fashion of a former time as sheer imagination.

Further it is clear that the therapeutic process under consideration is that of suggestion. The health idea is introduced into the mind with such intensity and exclusiveness that important mental and bodily changes automatically follow. Suffering is relieved, imaginary symptoms disappear, unhealthy emotions are replaced by healthy ones, inhibitions are established or removed as the case may need. Apparently in some instances the suggestion is so powerful as to produce complete analgesia resembling that of hypnosis. In many it is effectively prophylactic. Self-assurance of immunity through divine care may create a resistance to infection quite as efficacious as that of drugs. The psychophysical processes by which the organism responds to the mental condition of faith are only dimly understood, but there is no doubt of their actuality. Unquestionably the method often fails, and perhaps the extent of failure is much greater than that of success—certainly the apparent success of psychotherapeutic cults involves the ignoring or concealment of numerous failures—but even if this is true it ought not to blind us to the genuineness of results in other cases, or to the general potency of religion as a therapeutic agency.

This truth is more clearly understood in the light of what we know concerning the nature of religion and its fundamental place in human life. The belief in a higher power, or an invisible and beneficent order in the universe, an order or power to which we

are intimately related, is a world-old inheritance of mankind. Consciously or subconsciously it colors life for good or ill. Emotional expressions of it are strangely intense. Far more pervasively and fundamentally than many persons are aware it gives form to the daily life of the individual. Brought to bear upon any phase of experience, such as business, domestic relations, or ill health, it shapes this in accordance with its own character. Religious faith is the mental counterpart of the air we breathe. Ordinarily unobserved in any explicit way, it nevertheless has effects which are felt throughout the whole system of life. To apply this potential energy intelligently in the relief of human distress is a legitimate function of medical science. The fact that this has been crudely and superstitiously done in the past should be an incentive rather than a deterrent to careful study.

It should perhaps be noted, however, that those who use current forms of religious psychotherapy successfully are for the most part either the ignorant, whose faith is as intense as it is uncritical, or the cultured whose education has been of a non-scientific sort. Both types are evidently characterized by certain conditions of suggestibility, i.e., that state of mind which we termed "mental blankness," and which ranges from mental vacuity to a mere unfamiliarity with the subject of suggestion. Distraughtness of suffering, and respect for the prestige of religious dignity and of practical success also play their part. Scientific training, especially along physiological lines, and a certain kind of so-called

"common sense" tend to disqualify the possessor for effective application of religious psychotherapy. Contemporary science is on the whole inclined, wrongly, I believe, to regard mental phenomena as effects or accompaniments rather than as causes of physical processes, and this point of view is reflected in much uncritical opinion. There is no good reason, however, why a more exact knowledge of the relations between mind and body, including the mental and physical phenomena of religion, should not conduce to the effective use of suggestion in the treatment of disease. Health may be attained intelligently as well as ignorantly; neurasthenic impulses and inhibitions may be eliminated rationally as well as exorcized by authority. A mind which is psychotherapeutically suggestible along parallel lines of science and religion is much to be desired.

Religious psychotherapy is in some cases positively dangerous. It involves no reliable diagnosis, and so deprives many sick persons of the physical treatment which they need. Its unverified reports of diseases "which doctors pronounced incurable," and other allegations of medical helplessness, cast undeserved reproach upon the medical profession. The inevitable disposition to conceal failure, following enthusiastic acceptance and apparent or temporary success, not only work to disseminate unsound methods, but breed an encroaching dishonesty which sometimes penetrates other parts of daily life. The relentless imposition of it upon sick and helpless children is pathetic in the extreme, and its indifference to public welfare as conceived by the best medi-

cal science and the most thoughtful public opinion is so reckless that the sternest enforcement of law is sometimes requisite. Yet when all this is acknowledged we must not lose sight of the fact that religious psychotherapy is a power for good, occasionally more effective than any other kind of treatment, and requiring only wisdom in the direction of its faith to alleviate a large part of the suffering of mankind. What is needed is primarily a better discrimination between the cases which may and those which should not be dealt with apart from medical diagnosis, and secondarily a more studied practice of superposing religious faith upon medical care.

Faith Healing.—Passing to a consideration of the representative forms of psychotherapy, let us begin with the simplest. Faith healing, or divine healing as it is sometimes called, is the conquest of disease through sincere belief in God's power and love. Again and again in the history of religion men have made it their business to relieve human ailments by fervent appeal to God. The earliest traditions of Christianity were those of miraculous healing—they form, in fact, no small part of the gospel story—and it is quite in accordance with these traditions that divine power over the flesh as well as in the soul should be reasserted from time to time by the Christian ministry. Within the last few months in the locality where this is written two such notable persons have appeared, one an intelligent, unpretentious member of a large denomination, the other a strange figure, robed and bearded, calling himself "Brother Isaiah." Multitudes of sufferers have flocked to

them, and though there are no trustworthy reports of the permanent effect of their ministrations it is certain that many have felt themselves cured or at least helped in their diseases.

The method varies. Sometimes it is simply the healer's prayer or personal touch—"Brother Isaiah," referred to above, blessed the handkerchiefs of the sick, which thus became a means of cure. Usually an assertion of faith by the sufferer is requisite, and such rules as the following are prescribed.[1] (1) Be fully persuaded of the Word of God in this matter. (2) Be fully assured of the Will of God to heal you. (3) Be careful that you are yourself right with God. (4) Having become fully persuaded of these things, now commit your body to Him and claim his promise of healing in the name of Jesus by simple faith. (5) Act your faith. (6) Be prepared for trials of faith. (7) Use your own health and strength for God.

John Alexander Dowie, perhaps the most famous divine healer in recent times, distinguished four modes of the process: [2] (1) Direct prayer of faith, (2) intercessory prayer of faith, (3) the annointing of the elders with the prayer of faith, (4) the laying on of hands of those who believe, and whom God has prepared and called to that ministry.

Dowie certainly performed some remarkable cures; yet in his case as in that of other divine healers the record is so clouded with ignorance and fraud that a just estimate is not easy. In general it is clear that many of the diseases which patients suppose them-

[1] Weaver, *Mind and Health*, p. 316.
[2] Weaver, *loc. cit.*

selves to have, and from which they successfully seek relief by religious psychotherapy, are wholly or partially imaginary. Furthermore, the varied maladies which are overcome by faith are doubtless for the most part either psychoneuroses or bodily diseases with pronounced psychoneurotic accompaniments. Lastly, the recovery is sometimes only temporary, but the return of the affliction is of course not published. There are authenticated cases, in fact, of persons dying from diseases from which they had professed themselves cured by divine power. The general dubiousness of results is indicated by the transitory character of the performance. Faith healing comes in waves, and passes, leaving society apparently in the same condition as it was before. Were it as effective as one would like to believe, it would presumably be more continuous in its operation.

Whatever the form of the illness or the degree of recovery, the psychologist recognizes the facts as phenomena of suggestion. This hypothesis may be verified by close examination of particular cases, which reveals the special suggestibility of the patient, and the strongly suggestive character of the methods used by the healer. Granting this, however, it remains something of a marvel—not theoretically inexplicable by science, but nevertheless deserving a theistic interpretation—that the idea of health entertained under religious conditions can so effectively restore bodily well-being and peace of mind.

Christian Science.—Christian Science is by far the largest and most powerful of religio-psychotherapeu-

tic cults. The peculiar feature of its doctrine is its characterization of disease as "unreal." This does not imply that a cold in the head, or a case of typhoid fever or of tuberculosis is not a fact, but rather that it is a mental fact of an illusory sort, or in the language of the faith, "an error of mortal mind." Such an error, like any illusion, may be dispelled by intelligence and will. An understanding of its essentially unreal character, and a sincere and loyal profession of adherence to the principles of Christian Science, are held to be sufficient to put the evil illusion to flight.

The grounds on which this theory is based belong rather to theology than to psychology. In part they are a somewhat specialized form of the metaphysical idealism which has played so large and dignified a part in the history of philosophy. In part, too, they are found in that deep and almost universal conviction of the human soul that there is an inner order in the universe, the abiding power of which renders the things of this earthly life by contrast a mere temporary show and seeming. This faith, reënforced by some formal philosophy, results in the conclusion that disease may be overcome simply by the resources of the mind. Assurance of its unreality, and of the immanent, powerful presence of Divine wisdom and goodness in the human soul which desires its light and leading, constitute the orthodox prescription for the successful treatment of sickness. Reading of the Christian Science textbook, meditation upon its teachings, consultation with a professional practitioner, and throughout a pious and steadfast

rejection of the disease idea or "error," these are the practical methods of the cult.

For the student of applied psychology the problem with regard to Christian Science is simply, "How does it work?" Neither its general religious value nor the truth of its metaphysical principles is in question. Even the relative extent or frequency of its success and failure is a secondary matter. Important for our consideration is the fact that it works successfully as relief or cure in a multitude of cases, and the further fact that it possesses for a much greater multitude of persons a hygienic influence which is perhaps its most valuable quality. How shall we explain these facts as phenomena of psychotherapy?

For the psychologist there cannot be the slightest doubt that it operates by suggestion. The Christian Scientist denies this, since it seems to belittle or to ignore the Divine power which removes the illusion of disease, but such a derogatory interpretation is not necessary. Divine power may conceivably work through the process of suggestion, as through any law of nature. The methods of treatment prescribed by Christian Science clearly conform to the definition of suggestion as the introduction of an idea, in this case the idea of health, into the mind. Doubts are silenced; counter suggestions are frustrated. The mere reading of the textbook serves to distract attention from the suffering, while the solemn words of argument and assurance carry ever-deepening conviction. The idea of sickness, even the insistence of pain, is inhibited. The patient forms a mental

habit of ignoring the trouble, with the result that in many instances the trouble virtually disappears. Furthermore, he consistently *acts as though he were well,* and thus reënforces the health suggestion in one of the strongest ways possible. The process is supremely effective because of its religious depth. It is not mere fancy, but a profound belief, a faith to which the physical organism responds.

Such methods are most successful in dealing with psychoneuroses, especially the mild forms which are almost universally prevalent. They may also increase resistance to infection, or lessen its ravages within the organism. In any case in which the "*vis medicatrix naturæ*" is predominant, or the disease is self-limiting, it is a powerful aid. Under favorable conditions its efficacy is astonishing. Against virulent infections, on the other hand, it may utterly fail, no matter how earnest the effort to fill the mind with assurance. In general it brings to the sufferer from organic and structural maladies only a mental peace and a brightened outlook upon life—effects which should not be minimized. Broken bones lie so obviously beyond its scope that resort to surgery was authorized by the founder of the faith. Aside from this no rule can be stated for discriminating between the type of malady which yields, and that which does not yield in some measure to Christian Science treatment. The effectiveness of the latter depends upon the nature and intensity of the infection or other disorder, the physical constitution of the individual, and his susceptibility to suggestion.

In numerous instances there results a temporary

and transitory appearance of improvement or even of recovery, which presently gives way to the old symptoms, though sometimes not until it has served as a basis for testimonials of the power of Christian Science. Such temporary efficacy is often found by those who undertake new forms of treatment of any sort. It is purely a mental phenomenon, of course, and clearly illustrates the normal suggestibility of the mind under the emotional condition produced by disease. The mere fact that the person consults a physician, or takes medicine, or begins to read Science and Health with Key to the Scriptures, usually implies an expectant attention which serves for a while to inhibit countersuggestions of an unfavorable kind.

In the opinion of the writer the principal merit of Christian Science, psychotherapeutically speaking, is its mental hygiene. It prescribes the cultivation of a cheerful attitude toward life's sorrows, and a general banishment of the discontent, fear, worry, carping, and resentment which constitute a far greater burden to most persons than actual illness. A sunny disposition has a prophylactic value, but apart from this it is a blessing which most of us need, and which other forms of Christian faith would do well to include in their daily practice.

New Thought.—This designation is applied to a group of doctrines somewhat variously stated, without any special orthodox or canonical form, concerning the superiority of the mind over the body and the consequent possibility of avoiding disease by the cultivation of right mental habits. They are an out-

growth of the movement initiated by Phineas Parker Quimby about 1838. Several able writers, including H. W. Dresser, Ralph Waldo Trine, Henry Wood, and others have presented the ideas in philosophico-religious form and with literary skill. The teaching is distinguished by metaphysical concepts of an idealistic and pantheistic type, and also in some degree by its addiction to psychology, in which it finds scientific confirmation of its faith. Its fundamental thought is that of a Divine power immanent in the universe, and beneficent in its action, a power to which we are akin and from which we may draw sustenance for right living. The cult aims to prevent rather than to cure disease, and does not in general come into conflict with medical practice. Its psychotherapy, in fact, is only a subordinate aspect of a far-reaching philosophy of religion, the purpose of which is to elevate human life as a whole.

The effective use of suggestion in the teaching of New Thought is well illustrated by the practical exercises which are found in its literature. Thus Wood [1] directs the inquirer to "Retire each day to a quiet apartment, and be alone in the silence. Assume the most restful position practicable; breathe deeply and rather rapidly for a few moments, and thoroughly relax the physical body. Rivet the mind upon the suggestive lesson, fasten the attention upon its final ideal, try to *feel* it with every nerve center in the body. Give yourself to it until it fills and overflows the whole consciousness." The first of the "suggestive lessons" runs in part as follows:

[1] *New Thought Simplified*, pp. 169, ff.

"I come face to face with the great Fatherly presenee.

I lift my eonsciousness into contact with that mighty healing, loving, Divine Life which touehes me within and without.

I open my nature for an influx of life, love, harmony, and strength from the Overflowing Fountain.

I Open My Whole Nature to the Universal Spirit."

Further, we read: "My seeming trials and pains are not really against me. They are like the purifying fire which burns up the 'wood, hay and stubble,' leaving the real self unharmed and beautiful.

God never made illness, disorder, nor discord any more than He created sin. They are not normal nor in the highest sense natural. They are man-made perversions.

I disarm every seeming adversary and win it to my side by vibrating with it and not against it.

My recognition of the real purpose of pain takes away its sting. To see it as an enemy intensifies my distress.

Non-resistance is a Divine Law."

Let the reader repeat these assertions aloud, slowly, and with the tone and emphasis of conviction. Their suggestive power is immediately felt, as the mechanism of psychophysical emotion responds to the verbal stimuli. Serious utterance of the words deepens subconscious attitudes of assurance and exaltation, states of mind which reflect themselves in bodily welfare. Sincere and patiently pursued, such a practice undoubtedly serves to promote health, and what is at least equally important, peace of mind.

The Emmanuel Movement.—The Emmanuel Movement is noteworthy as the most painstaking attempt to combine the forces of religion and science in the treatment of disease. Started in 1906

by some Boston clergymen who enlisted the coöperation of several able practitioners of medicine, it flourished for a few years and spread to other cities. The design of the effort was to secure from competent physicians a reliable diagnosis of the physical and psychophysical aspects of disease in cases which came to the professional attention of clergymen, and concurrently with medical treatment to administer psychotherapy to the disordered mind. The psychotherapy, it should be observed, lay largely in the hands of the minister, who was presumed to understand not only its religious but also its scientific operation. This presumption was justified in some measure by the fact that the clergymen who were interested in the movement were familiar with psychological principles, and even able in some instances to practise hypnotism.

Promising as the effort seemed, it proved to be short lived. Psychological and medical critics condemned it as superficial in theory and hasty in practice. Physicians stood aloof and clergymen for the most part found themselves led along other lines of ministry.

The history of the movement raises doubts about the possibility of effective coöperation between the religious and the scientific psychotherapists. The difficulty is twofold, partly the lack of time for deliberate conference in busy professional lives, and partly the difference of points of view, one of which must practically be subordinated to the other in the treatment of cases. It appears to the writer that maladies which are severe enough to call for con-

certed action belong primarily to the medical specialist, both in diagnosis and in prescriptive method of treatment. As a possible ally of the scientist, however, the physician of the soul possesses peculiar power, and it is unfortunate that this supplementary service is not oftener brought to bear upon suffering. It remains true, of course, that in a multitude of everyday mental troubles of a minor sort religious psychotherapy is practically the major part of what is needed.

QUESTIONS AND EXERCISES

1. What is the nature of disease, as seen from the standpoint of religion? How, in brief, can it be cured?

2. What are the principal types of psychotherapeutic cult? How do they differ in fundamental principles and scope of treatment?

3. What is the mental principle with which religious psychotherapy works? Why is the religious application of this principle especially effective?

4. What are the dangerous or otherwise objectionable features of religious psychotherapy?

5. State the doctrine of "faith healing." What are its general methods? How are its successes explained psychologically?

6. How does Christian Science define the nature of disease? What are its methods of therapeutic treatment?

7. Show in detail how the effectiveness of Christian Science practice is explained psychologically.

8. Distinguish between the therapeutic practice of Christian Science and its mental hygiene as applied to life apart from specific disease.

9. What is the psychotherapeutic aspect of New Thought? How does its attitude toward scientific physiology and psychology differ from that of Christian Science?

10. What was the peculiar character of the Emmanuel Movement? What special difficulties did it encounter?

11. To what extent does religious psychotherapy seem to you desirable as an independent practice?

12. Is it necessarily incompatible with scientific psychotherapy in actual practice?

CHAPTER XV

EVERYDAY PSYCHOTHERAPY

The Problem; Point of View; General Methods. —There is abundant opportunity in everyday life for the exercise of psychotherapeutic principles by any intelligent person. Serious maladies should, of course, be diagnosed and treated by those who are specially trained for the purpose; self-doctoring in such cases is dangerous folly. But this truth does not touch the fact that almost every individual life is beset in some measure by minor physical and mental troubles which can be eliminated or lessened by methodical attack along psychological lines. Nervousness, sleeplessness, worries, slight but annoying fears, bad ideas and impulses—who has not been harassed by them, and longed for some way of putting them to flight? Though not sufficiently grave to warrant consultation with a specialist, or even with one's family physician, they nevertheless call for remedy. Everyday life would be much happier if they were removed. What is the proper method of dealing with them?

First and foremost it is requisite to take the point of view that these disorders are matters of mechanical cause and effect. For our present purpose they are not to be regarded as moral faults, but rather

as automatic processes analogous to the slip, friction, or racking of a machine, processes which call for readjustment of the psychophysical mechanism. Scolding and arguing, therefore, are usually out of place, in fact almost as much so as in dealing with a misbehaving typewriter or automobile. What is needed is an intelligent manipulation of the mental machinery. To get the patient, whether one's self or another, out of the state of mind of self-accusation, futile "good resolutions," or confessed helplessness and hopelessness, into the calmer condition of undertaking a methodical task of autosuggestion or following a daily routine, is often a large part of the process. To look upon the trouble as a doctor at a case of fever, i.e., as a matter of nature's laws, to be abated by the working of other laws of nature; to study it dispassionately and experiment patiently —this is the needful approach to success in treatment. Occasionally, no doubt, appeal to the will is desirable. Reproof, shame, and encouragement have their own distinct effectiveness. But even these appeals may be regarded as operating automatically, as mental pills and powders, so to speak, the efficacy of which is mechanical. The first step, in any case, is that of saying calmly, "Here is a troublesome state of mind which is produced by certain causes, and which will yield to a certain change of conditions. What is the appropriate change?

The methods of procedure in carrying out psychotherapeutic treatment from this point of view are various, some general and familiar, others special and technical. To enumerate some of the principal

ones briefly: Regulation of conditions of daily life is usually desirable as a means of producing a general mental change which serves as a background for recovery. Sleep, rest, freedom from noise and excitement may be of fundamental importance. Adequate work involving regularity and responsibility often has medicinal value. Play and recreation, both physical and mental, are likewise prescriptions of the psychotherapist. Proper social environment and social duties extend the tale of these general conditions upon which rests the welfare of mind and body. The treatment is psychotherapeutic in that the state of mind which naturally results from these normal activities of life tends to inhibit the troublesome symptoms.

More specialized as psychotherapeutic methods are the expert employment of explanation and persuasion, of balanced sympathy and indifference, of encouragement, of moral appeal and religious faith. Are these familiar usages psychotherapy? it may be asked. They certainly are, and none the less valuable because of their familiarity. But it should be added that they are psychotherapy only when wisely used, and that the art of using them effectively is much more subtle than it is commonly taken to be. Here the personality of the psychotherapist and that of his patient are conditions of prime importance. One person understands and profits by an explanation of his troubles; another simply needs orders. Religious conviction that all is well because it is in God's hands is a powerful specific for some cases, though impossible in others. When to ignore dis-

tress, and when and how to use words and gestures of sympathy, are points for which no precise rules can be given, especially since the methods which one uses in a particular case will fail in the same case if used by another. Every case in fact needs its special kind of treatment relative to the personalities involved, and the conditions of success are often bafflingly subtle. Yet the efficacy of these everyday curatives is sometimes greater than anything else which can be brought to bear. Used by persons of natural gifts of trained expertness they work wonders of improvement. As the first principle of everyday psychotherapy is that of taking the mechanistic point of view with regard to afflictions, so the second is tact and thoughtfulness in applying these common influences upon the mind.

In the next place let us note that there are certain processes of suggestion and autosuggestion which lie within the range of everyday psychotherapy. For example, artful methods of dispelling stage fright or insomnia by automatically inducing appropriate states of mind properly belong to any intelligent student of the subject. Even the somewhat technical business of substituting one idea for another, of side-tracking an objectionable emotion, and of reëducating an individual whose psychic or motor tendencies have become perverted, may be practised helpfully in daily life. Compare, for instance, the difference between scolding or ridiculing a child who is afraid in the dark with the wiser procedure, followed no doubt in many a household, of cultivating the imaginative power of seeing the

dark place as it looks in the daylight, of substituting for the idea of ghost or goblin the fancy of a kindly spirit which watches over little ones, of explaining that night is the time which nature gives us for peace and rest, and so on. Not infrequently do our troubles succumb to the repetition of verbal formulas which exercise inhibitory power by pointing in another direction. Resolute utterance of words of courage and hope has this suggestive effect. The writer enjoys the acquaintance of a diminutive youngster who salves his painful bumps and bruises by the sturdy declaration, "Happy boy now!"

The more distinctly technical methods, particularly hypnotism and psychoanalysis, are emphatically not to be included in this homely psychotherapeutic pharmacopeia. Only persons of scientific training can use these with safety. Practised by the tyro they are dangerous, even though they seem brilliantly successful. It is as foolish for the untrained to experiment with them as for the layman to prescribe powerful drugs.

Neurasthenia.—Neurasthenia is the name commonly applied to the condition of nervous debility and exhaustion. Its symptoms are manifold, the central one being a chronic feeling of fatigue. Attending this in varying measure are headache and sleeplessness, sometimes numbness and dizziness. Most characteristic are tendencies to irritability and depression, short lived exhilaration alternating with moodiness and ill temper, persistent self-analysis, self-pity, or condemnation. The neurasthenic is given to imagining scenes and situations, especially

social conflicts, in a way which stimulates his nervous system and produces an incipient physical reaction of some sort—an angry gesture, a shudder of fear, or a habit of talking to himself. At its worst it becomes pathological, and shades into severer mental maladies or results in "nervous prostration." In lesser degrees it is a common affliction, usually not needing professional treatment, but certainly calling for relief by self-control and the "home made" psychotherapy with which we are interested in this chapter.

Its causes are as various as its symptoms. Basically there is doubtless some predisposition in the inherited character of the nervous system. But it is distinctly a functional disorder, and its appearance may be due to a wide variety of common conditions and everyday occurrences. Among these excessive fatigue and emotional shocks are especially important. Alcoholic stimulants, gambling, and sexual vice are to blame for a multitude of cases. Where there is no accident or moral fault the constant overstimulation of the life of today, with its incessant noise and protracted glare of light at night, its business and social competition, and the thousand and one devices of speedy travel, communication, information and exciting amusement, all work together to exhaust the nervous system and produce the well-known symptoms of "nerves." At bottom, however, the neurasthenic is of a certain nervous type, sensitive, easily fatigued, emotionally unsteady.

Before attempting to indicate methods of dealing with this trouble let us note that it is not simply a

misfortune. Many a famous character in history has shown neurasthenic symptoms, and we may regard these as but the dark side of the traits which produced greatness. Sensitiveness and quick play of emotion have their peculiar value. The victim of neurasthenia often possesses a potency of intelligent sympathy which is a source of extraordinary power. Sympathetic intuition combined with cheerfulness and wisdom constitute a personal charm which not only wins loyalty, but also affords helpfulness of the highest order. A person of neurasthenic disposition ought frankly to face the alternative, "Shall I allow myself to become a slave to my nervous system, or make it my efficient servant in aiding others?"

In dealing with neurasthenia it is necessary to bear in mind that in so far as it arises from purely physical causes, such as systemic poisoning by impure food, the removal of such causes is a primary requisite. Psychotherapeutic methods by themselves are inadequate. Furthermore, the bad physical and mental habits which often underlie the symptoms, for example late hours and excessive pleasure seeking, should be changed directly if possible. More broadly stated, the neurasthenic needs to lead a carefully regulated life of work and play, rest and recreation, social relations and social responsibilities. An orderly habit of life, one which does not subject the nervous system to excessive strain, is of basic importance. Mere rest is insufficient, and "rest cures" have found it necessary to supplement themselves with appropriate work. So also while solitude may be

needed frequently a cheerful and agreeable social environment is equally desirable. Particular symptoms call for special methods of treatment, but these should rest upon a foundation of physical and hygienic treatment which makes for health.

The more distinctly psychotherapeutic treatment of neurasthenia aims directly at relief from the unpleasant symptoms, particularly the constant feeling of weariness. To a very large extent this is not an indication of genuine physiological fatigue, but is rather a mental phenomenon of an illusory sort, a "fatigue memory" which lasts as a kind of mental echo of former weariness, intensifying whatever slight amount of real fatigue happens to exist. As everyone who has observed the neurasthenic knows, it may give way instantly to a fresh interest, and be entirely lost in pleasant activity. This is one reason why appropriate work no less than rest is a feature of successful treatment in sanitariums and elsewhere. It may also yield to methodical autosuggestion, as the patient impresses upon himself by word and act the assurance that he feels fresh and vigorous, and that the tired feeling is an objectionable vagabond of the mind, not to be tolerated for an instant. The ordinary sufferer, though perhaps not the more settled victim, can learn to say with sincerity, "I am well and active. I have no weariness which I need to pay attention to, or permit to interfere with my enjoyment of life." Or the formula may be judiciously varied, "Tired? Of course I am tired. My mind naturally feels that way. But it needn't keep me from doing my work. And when I

get really tired out I will stop and get rested." Suggestible persons can say this sort of thing frequently and with tones of conviction, until a subconscious attitude of indifference and opposition to the fatigue is established.

So, too, the accompanying symptoms of irritability, self-pity, unhealthy imagination, and the like, may be exorcized by skilful suggestion. These symptoms are mere mental shadows of insignificant facts, exaggerated shadows which naturally fall upon the neurasthenic mind, and the knowledge of this truth may be sufficient to dispel them. In case they are not driven away so easily one may cultivate habits of speech and behavior which make against the symptoms according to the fundamental principles of emotional resonance. Night and morning one may repeat his formulas of strength and confidence, of patience and kindliness, until their emotional tone pervades the character.[1] If one is inclined to practise this method in the way of religion, with prayer and reflection, so much the better. The success of certain psychotherapeutic cults is of course explained by the superior power of religious faith in strengthening suggestion.

In some cases a distinctly rational form of suggestion is effective. An assurance of superiority to neurasthenia based on a clear understanding of its physiological and psychological nature may be

[1] Undoubtedly many persons have helped themselves by repeating, steadily and calmly M. Coué's famous formula: "Day by day, in every way, I am growing better and better." It is noteworthy that the simple rhyme and rhythm lend themselves effectively to the mechanism of autosuggestion.

developed with the peculiar suggestive force of scientific truth. With persons whose intellectual level permits this approach, and especially with those who are naturally less amenable to sub-rational forms of suggestion, the method of elucidation and persuasion may be most helpful. I am inclined to think that a good many of our college bred neurasthenics need this application of psychology.

An indispensable precondition of success, be it noted, *is a sincere desire to conquer the neurosis.* The neurasthenic joy of being irritable and of making others uncomfortable must be formally and honestly surrendered. The obstinate difficulty of many a case is explained by the deep-rooted unwillingness of the sufferer to give up the peculiar satisfaction which he experiences through suffering. The vitality of this underlying disposition effectually blocks all efforts at reform. Here as elsewhere in applied psychology we discover the fundamental importance of "attitude." The conscious and subconscious factors must be initially set in the right direction. And this attitude must be persistent. No mere spasmodic desire for relief is adequate. We must wage the battle incessantly until we establish a permanently anti-neurasthenic régime in our daily life.

The frequent complication of neurasthenia with insomnia makes it desirable to speak of the possibilities of psychotherapy in relieving the latter affliction. Sleep, psychologically considered, is a more or less complete cessation of consciousness with tendencies to mental imagery of a dissociated type,

especially in the lighter, part-way stages between deep sleep and waking. We naturally go to sleep when fatigued, or at regular times, the process being facilitated mentally by the usual "sleep suggestions" of excluding stimuli of light and sound, lying down, and stopping the course of thought. The normal expectation of sleep at the usual time is a highly important factor; in this sense of the term sleep may be called a habit.

When we lose this natural form of rest, and the expectation and habit of sleeplessness supervene, the plight is distressing. Since the source of the trouble is mental rather than physical, sleeping powders fail to go to the root of the matter. While they owe their efficacy partly to the accepted suggestion of their peculiar power, they incidentally convey the further and highly unfortunate suggestion that the user cannot sleep without them. This in addition to the fact that their physiological effectiveness diminishes with continued use makes them especially dangerous. Except for occasional employment under competent medical direction the practice of inducing sleep by them is wholly unjustifiable. Münsterberg remarks: "To overcome the monopoly of the opiates is one of the most important functions of psychotherapy."

In seeking sleep it is requisite first of all to have body and mind in as quiescent a state as possible, free from physical tension and emotional excitement. Much may depend upon what one does, and especially upon what one reads before retiring. Mental workers not infrequently form the habit of

warding off insomnia by indulging in a relaxing exercise, reading a light story, or otherwise changing the current of the mind. It is usually well to postpone going to bed until one has done this. In any case the initial desideratum is that state of bodily relaxation and dispersed attention which is a fundamental condition of suggestibility. This state, in fact, serves to a considerable extent to dispense with the need of sleep. Persons with a tendency to insomnia may learn to rest without actually going to sleep, thus obtaining the same benefit while preparing themselves most effectively for the "dropping off" which eventually comes. Perhaps no method of dealing with sleeplessness is more satisfactory than that of learning to relax mind and body while still awake.

Sleep suggestions are of various kinds. First we have the direct suggestions, for example the murmured repetition of such assertions as "I feel sleepy, I am going to sleep," or a more explicit dwelling on one's sense of fatigue and the gratefulness of rest, the postponement of worrisome problems until the morrow, and so on. This method, needless to say, is effective only with the more autosuggestible type of mind and in the lighter degree of insomnia. Second, there are the processes such as counting, slow breathing, synchronous counting and breathing, repetition of poetry, and the like, which serve to hold the attention away from troublesome topics of thought and to induce bodily relaxation. In mild cases a few minutes of this sort of thing sometimes suffices to raise the threshold of consciousness so that

sleep ensues. Especially helpful is the habit of imagining pleasant scenes of occurrences—sunny pastures with cattle browsing, the fragrant shadow and soothing murmur of pine trees, nodding palms and the drowsy hum of insects, long lines of surf beating on glistening sand, the sound of distant church bells. To remind oneself that one can rest even while awake, and then to dwell on whatever mental pictures seem restful, is for some an efficacious prescription for slumber.

But such devices, after all, have only a limited range of efficacy. They frequently fail because they do not reach the root of the trouble. Hence the method which in the long run is perhaps the most important is the rational and suggestive attack on the cause of sleeplessness. This cause is often to be found in some felt difficulty of life, some baffling practical problem especially of money matters or personal relationships with its attendant emotional unrest which lurks subconsciously even when the mind is not bent upon it, ever ready to thrust itself into the foreground. Its intensity not only prevents the approach of sleep, but may even waken the sleeper, who forthwith finds himself puzzling over the irritating subject in the middle of the night. What is needed here, of course, so long as the problem remains unsolved, is the steady suggestion of inner peace, of the ultimate or at least temporary insignificance of the trouble, or of its eventual removal, so that the sufferer lies down with the deep conviction, "Nothing really matters for the next eight hours." Instead of carrying our difficulties consciously to bed

with us we should cultivate by methods of suggestion the fundamental attitude of leaving them behind, and turning to the oblivion of sleep as a blessed escape from their power.

These counsels are easy to give, but are often hard to follow in the way which brings relief. They call not only for persistence, but for ingenuity. It should be borne in mind that no single prescription meets the needs of every case, and that the individual's own skill in devising a remedy for himself is likely to prove more efficacious than is any external direction. In many cases, too, the most which can be expected is not a complete freedom from neurasthenic affliction, but rather an increased ability to endure this with cheerfulness, and to control its outward manifestations so that one does not become a nuisance to one's associates. This, however, is real victory.

Psychasthenic Tendencies.—Psychasthenia is characterized by obsessing mental images and fixed ideas, by persistent emotions, especially fears, and by irresistible impulses. The disorder is closely related to neurasthenia and hysteria; its distinguishing feature is the persistence of some abnormal mental trait. In its worst forms it approaches insanity. The true psychasthenic, however, knows that the apparent object is hallucinatory, that the idea is a delusion, and that the emotion has no adequate reason, but he cannot get rid of them. He may be thoroughly disgusted with his own impulsions, yet he yields to their power. The neurosis shades by degrees into states such as worry or fear of the dark,

which can hardly be called abnormal. A multitude of persons who may be regarded as "perfectly healthy" are occasionally troubled by slight psychasthenic tendencies.

The most common of these is worry. Psychologically this consists of persistent attention to an unpleasant subject such as a money problem, uncertain professional position, symptoms of ill health, the plight of a relative, and the like, with pervasive emotions of anxiety and helplessness, and a constant bodily tension. The feeling tone is predominantly unpleasant, though, like any habit, that of worry becomes peculiarly agreeable in its own insidious way. Hence the psychotherapeutic treatment begins here as elsewhere with the assumption of the right attitude. "Do you really want to stop worrying?" is a question which sometimes is more significant than the worrier supposes. Beyond this point the desirable method to follow is that of suggestion rather than of reason. To show that the worry is irrational is often futile. The worried mind may know that perfectly well, while the mechanism of nervous distress continues to grind; or, worse, the concern may have its own subtle rationality which skilfully baffles argument. More effective is the deliberate construction of mental imagery of a kind which automatically opposes the worry. One may use the power of imagination to picture health instead of disease, and gain instead of loss, or to represent the absent one as safe and happy rather than in danger. In fact one may cultivate the mental habit of replacing every intruding fear that

something is going wrong with a clear idea of just how it is going right. The possibility of doing this sort of thing is much greater than we ordinarily allow, as the phenomena of religious psychotherapy convincingly show. Further, apprehensive worriment may sometimes be dispelled simply by doing something, taking some action appropriately designed to meet the difficulty or danger in question. Thus the act of consulting a physician or of writing a letter may serve to draw off the energy which would otherwise be spent in worrying. Many a fond mother and sister saved herself from imaginative torture during the war by knitting. The emotional state, it will be remembered, tends to follow the lines laid down by the special form of activity, and to agree in tone with the purpose of the latter. Helpful behavior produces a cheerful state of mind. In any case principles of relief are found in an initial mental "set" in the right direction, clever substitution of one kind of mental imagery for another, and active "side-tracking" of the impulse to worry, all of which practices contribute to a gradual reëducation of the mind.

Psychasthenic fears are of many kinds. Some, like fear of the dark, of high places, and of audiences, i.e., "stage fright" are very common; others are peculiarly individual afflictions. Their origin is sometimes to be found in an emotional shock in childhood, but in most instances the source is shrouded in the obscurity of the past. Severe cases may call for a psychoanalytic search for the cause; the mild forms which are so familiar may usually be

relieved by more direct methods. Here, as in dealing with worry, there is need of ingenious counter-suggestion, diversion of the fear energy into calmer currents of discharge, and methodical reëducation in emotional and motor habit.

As a typical case we may note that of a young woman of highly nervous temperament who was harassed in every college examination by the fear that she was making a failure, that she had missed the point of the questions, that her answers were absurdly wrong. As she was really intelligent and conscientious there was no ground for the fear. In order to overcome it she was told to write without the expectation of handing in the paper, but to keep it and read it over later, if she desired, with the assurance that if it proved to be irrelevant she might have another opportunity to take the examination. As a matter of fact she never kept a paper. The mere possibility of doing so served to prevent the fear, which was thus safely side-tracked. Another illustrative case is that of a young woman who had a strong tendency to faint when her physician administered a hypodermic injection. She ingeniously lessened her difficulty by persistently imagining the operation in advance, and controlling the physical reaction, so that when the actual moment came the reaction was modified and the fear consequently diminished.

In this connection we may also note the possibility of lessening stage fright by preventive measures. The victim of this common trouble should assure himself in advance that public appearance is

a privilege and an opportunity—as in fact it usually is. If necessary he should argue the point with himself until he has fixed it clearly in mind, and should carry this positive attitude with him on the stage. Next, he should imagine an audience as vividly as possible in rehearsing, so that from the start his performance is mentally associated with the idea of facing an attentive company. It is well, of course, to rehearse before smaller audiences, groups of friends, or any listener who can be coralled for the purpose. There will then be less of a shock when he finds himself actually confronting a throng. If he feels physical tension on the stage it is possible in some measure voluntarily to relax the muscles, and to assume the posture of ease and appearance of self-confidence. More important, however, is the steady fixing of attention on what one has to say or do. This attention, based on thorough preparation in general attitude and in detail, and provided with whatever cues may prove useful in case of need, is most likely to carry the performer through his part.

Many psychasthenic ideas are of a very specialized character, sometimes accompanied by painful emotion, sometimes mere uncomfortable intruders into the mental life. Ideas of horrible dangers, ridiculous misfortunes, disgusting and repulsive objects may obsess the mind, defying every resolve not to think of them, and interfering seriously with business and happiness. They usually succumb, however, to a methodical countersuggestion, which substitutes other and harmless ideas for them, or develops them

into a less disagreeable form. A few illustrations will suffice.

Münsterberg mentions the case of a man who suffered from a vivid tactual hallucination that his wrists were being cut. It gave way in a few days to the simple treatment of gazing steadily at his wrists for ten minutes at a time, until the visual sensations inhibited the hallucinatory tactual ones. In this instance the counteracting agency was perceptual. Frequently it is imaginative, as in the case of a young woman who, whenever she rose with the congregation in church, was beset by the idea that she could not sit down again, but would have to remain standing, to the amusement of all. Though the misfortune never occurred, and she was too sensible to be greatly distressed by it, she nevertheless found it in its own small way a nuisance. Instead of combating it directly she side-tracked it by imagining herself walking serenely out of church, whereupon it ceased to trouble her. Similarly, a man was repeatedly annoyed by the thought of catching his foot in a railroad switch while an oncoming train rushed upon him. The recurrent imagery probably arose from having heard or read of some such tragedy, and it always brought an organic thrill of painful fear. It yielded to a deliberate autosuggestion of extricating his foot by a peculiar twist. So, too, the milder forms of auditory hallucination, such as persistent ringing in the ears, may sometimes be removed or at least rendered less irritable, by being methodically associated with pleasant topics of reflection. The general principle

in any case is that of constructing a definite channel for the release and transformation of the psychasthenic energy.

Turning to the class of psychasthenic impulses, we find such illustrations as habitual talking to oneself, needless counting and repetition of little actions, avoidance of persons on the street, inclination to petty and useless theft, profanity and indecent speech, wrong sex impulses, and the like. Since their motor character implies that they are in some measure ingrained in the psychophysical organism, they usually call for reëducational treatment with the same features of preliminary attitude of opposition, specific countersuggestion, antagonistic or side-tracking habit, which we have noted as applicable to other difficulties. Thus persons who persistently talk to themselves about their troubles overcome the impulse simply by choosing happier topics of conversation, a diversion of energy which soon puts an end to the habit. The unwillingness to meet acquaintances face to face, that strange shrinking which leads the victim to cross the street or turn a corner out of his way rather than undergo the experience, may sometimes be frustrated by assuming a positive attitude of courteous or even eager greeting, and formulating actively a cheerful salutation. When we grasp the principle of constructing artificially an attitude or idea which will touch off an opposing or divergent tendency, we find that the objectionable one lies within our power of control.

In settled cases a varied and protracted applica-

tion of this principle is necessary. A young man who found that his impulse to profanity threatened to assume psychasthenic proportions sought to free himself altogether from the habit. He set about it by putting down in writing all the good reasons he could think of why he ought not to use profane speech, and reading them over daily. Further, he formulated a carefully worded pledge which he regularly repeated to himself night and morning. He also fined himself for infractions and periodically reported his progress to a friend. The latter factor proved especially efficacious. The unwillingness to make a bad report produced a subconscious mental set in the right direction, so that he eventually expurgated his vocabulary.

An interesting example of psychical reëducation is that of a girl who had been troubled from early childhood by a fear of noise. She was healthy and naturally cheerful, but suffered keenly from thunderstorms, explosive fireworks, roaring trains, and the like. A slamming door made her cringe, and the starter's pistol at a track contest served to keep her away from the field. "Some of my friends wonder why I tear up every paper bag I find," she said with a smile. She overcame the fear by a prolonged effort in which there were several graduated factors. It began with the deliberate imagination of noise, accompanied by persistent relaxation of the tense muscles, which automatically stiffened at the mere thought. From this she advanced to actual experience of noise, increasing degrees of which were provided in varied and ingenious ways by obliging

friends, who participated in the treatment with the utmost cheerfulness. The process continued for several weeks with the general character of a protracted joke, and a steady elimination of the unpleasant reaction. The outcome was a comparative freedom from the fear, and a normal enjoyment of much that had previously been painful.

The difficulties under discussion in the foregoing paragraphs are not as a rule very serious; in fact they are so slight as hardly to deserve the designation of "psychasthenia." They are removed only by degrees from the graver psychasthenic afflictions, however, and it is worth while to learn how to deal with them intelligently along psychotherapeutic lines. In this way one may not only avoid their discomfort, but may also prevent them from developing into a more troublesome form.

QUESTIONS AND EXERCISES

1. A distinguished psychologist once remarked that "seventy-five per cent of human suffering is not of the sort that comes to a doctor's attention, yet it needs some kind of therapeutic treatment." Just what did he mean by this?

2. Explain clearly what is meant by taking a mechanistic point of view with regard to such troubles?

3. How do the methods of "everyday psychotherapy" compare with those of the professional practitioner?

4. What are some of the familiar symptoms of neurasthenia? What conditions of contemporary life tend to accentuate it?

5. What possible values does the neurasthenic constitution possess?

6. What is "neurasthenic fatigue," and what is the proper treatment of it?

7. Formulate some appropriate autosuggestions for use

in counteracting neurasthenia. What is the fundamental condition of effectiveness of such autosuggestion?

8. How may insomnia be dealt with on psychological principles? In what respect are opiates psychologically objectionable?

9. What kinds of common experience verge on psychasthenia? What is their distinctive characteristic?

10. Show how methods of autosuggestion may be applied to prevent worry. Why does the effort to dispose of another person's worry by reasoning usually fail?

11. Show how autosuggestion may be applied to psychasthenic fears of different kinds.

12. What special prescriptions for "psychical reëducation" would you recommend for application in a case of persistent fear of revolving machinery?

PART FOUR

INDUSTRY AND COMMERCE

CHAPTER XVI

VOCATIONAL SELECTION

The Field of Industrial and Commercial Psychology.—The most recently developed of the grand divisions of applied psychology is that of industry and commerce. While these arts have always been practised with shrewd and effective knowledge of the workings of the mind, it is only within the last two decades that the professional psychologist has entered the field with technical criticism and experimental investigation. The reason for this long delay is found mainly in the traditional separation of business operations from higher education. Whereas the pathways of teaching and medicine passed through the college or university, and accordingly presented problems in the light of learning, the practices of manufacturing and selling pursued an independent course. The men who handled machines or sold goods, or who directed the work of office, store, and shop, had for the most part little contact with the scientific lore of the mind, and no great appreciation of its value. An untechnical but practical psychology of everyday life served their purposes. On the other hand scientific psychology was ill adapted to deal practically with the complexities of economic life. Its refined analyses had been

undertaken from other motives and pursued in other directions. At length, however, certain business men and psychologists became sufficiently interested in each other's work to see their possible relation, and the psychologists proceeded to formulate this relation systematically. Once started, the new branch of applied science made flourishing progress, the more rapidly as its tremendous economic importance was appreciated. While the development has been characterized by a good deal of pretentious but superficial effort, it has also made solid contributions to industrial and commercial life.

The psychological reality of the field cannot be questioned. Operatives at lathe and loom, in mine and forest, on train and ship, clerks in store and office, foremen, managers, superintendents, owners, —all are essentially *minds*. Their conscious relations to the material things which they use and to one another are determining factors of efficiency or inefficiency, and so of economic consequences. Selection of an incompetent candidate for employment results in failure and discouragement, defective vision or hearing leads to accident, skilful teaching of an apprentice saves time and money, methodical arrangement of work minimizes fatigue, harmonious social conditions increase factory output, the proper phrasing and placing of an advertisement doubles its effectiveness. Recognition of these facts and a thousand similar ones has always been "common sense"—though none too common. Today the scientific apprehension of them is leading to important improvements in business method. Familiar

psychological principles are being applied to economic situations. Problems are subjected to experimental investigation by specialists, with far-reaching results.

At the same time we must repeat our warning against over-confident enthusiasm. The steady advance of industrial and commercial psychology has carried along with it much absurd "pseudo-science," a pretense of scientific acumen quite without foundation. Some of this is common sense and general observation of human nature, dignified by the designation "psychology." Among its more disreputable forms are phrenology, with its nonsensical ideas about vocational fitness, and the purveyance of superstitions about subconsciousness and suggestion. Its lure is the promise of speedy results. As in the field of medicine, however, so here quick methods are usually quack methods. Psychology possesses no magic touch which enables it to solve human problems instanter; its investigative work should be as cautious and patient as that of other departments of science. Moreover its application to industry and commerce is especially difficult because of the intricately individual nature of many of its problems. Whether its conclusions will fit this or that particular worker or group is always more or less doubtful. General principles are inevitably in danger of being invalidated by the diverse and subtle conditions of economic life, conditions which are easily overlooked, but the understanding of which is vital for the solution of economic problems. In short the psychological task is an exceedingly

laborious one. Broadly speaking, the world of commerce and industry is a largely unexplored but fertile and productive jungle.

We may conveniently distinguish six groups of psychological problems in the economic life of mankind. First there are the questions relating to individual capability, or as it is commonly termed "vocational selection." How may a candidate's fitness for a particular kind of work be tested scientifically in advance of actual trial? Or, more broadly, how may his various qualifications be ascertained, so that he may be directed into the work for which he is best fitted? Second, there are the problems of perfecting skill. These include general methods of instruction, the special psychophysical training of the worker, and the stimulation of the spirit of learning. In the third place we have those matters which belong to the technique of operation, such as the arrangement of work, adaptation of tools and machines, the use of office appliances, and the like, in such a way as to eliminate fatigue, avoid waste, and produce maximum output in quantity and quality. Fourth, assuming that the worker is technically competent and properly equipped, contemporary industry faces the problems of establishing the social and moral conditions which help to maintain his effort at a high level of efficiency. Under this head come such topics as wages, advancement, comfortable material surroundings, forms of social organization, recreations, and participation in management and profits. Fifth and sixth, the ultimate part of the whole process which is the sale of

goods, involves its own psychological problems of advertising and salesmanship.

In all these special fields the aim of the psychologist is to discover the operation of the mental laws which characterize the work, and so to bring its processes under intelligent control. It should be observed that this aim implies taking the mechanistic point of view, that is to say regarding economic processes as of such a sort that the establishment of certain conditions will be naturally and inevitably followed by the desired results. But equally, the scientific specialist must not lose sight of the fact that the worker is always a human being, never a mere machine. He is a creature with purposes and emotions, varied interests and numerous frailties. To regulate his work efficiently and at the same time to enable him to maintain his human character and attain his ideals, are the difficult but stimulating tasks in this department of applied psychology.

The Problem of Vocational Selection.—The historical background of this subject shows that the choice of an occupation has been determined by a wide variety of factors. Imitative tendencies have always been especially influential. Tribal habits, social custom, family tradition, and casual example have played the largest part. In all ranks of society children naturally follow in the parental footsteps or look with their associates for the nearest and most lucrative job. In a manufacturing town youth turns to the factory for a livelihood, in a commercial center to the stores. Sons of professional men usually

enter a profession, though frequently not the paternal one. The social esteem in which the more intellectual vocations are held renders them attractive, so that they exhibit a constant influx from below. Here as elsewhere suggestion operates subtly to implant in the mind an interest in this or that kind of work.

Certain pseudo-scientific influences also deserve notice. In the past astrology has had much to say about vocational bent, and professional impostors still direct dupes according to their horoscopes—informing them solemnly, for example, that the ascendancy of the planet Neptune at their birth points toward a seafaring life! Phrenology has likewise given much counsel; in fact there is at present a recrudescence of quack psychology of phrenological sort, with its "consulting experts" who advise employers and employees as to vocational qualifications. Physical traits, especially those of face, head, and hand, are the alleged basis of this guidance, though in reality the latter depends more upon shrewd discernment of the intellectual and moral character of the candidate.

Rational guidance, based on the individual's mental characteristics, is relatively rare. For the most part the grounds of selection are found in proximity to or casual contact with the job, interest due to such proximity or contact, the example of someone and of course the desire for money, power, and social position. On the employers' side the determining factors are cursory inspection, recommendations, and inference from photograph or handwriting. Seldom

is there any detailed or careful inquiry concerning the special qualifications of an applicant.

In consequence there are numerous misfits. The apprentice's lack of ability is discovered by actual failure, it may be, after a considerable waste of time. Eventually he proves hopelessly slow or inaccurate, and so passes with his burden of conscious incompetency to another occupation. If this experience is repeated, a "habit of failure" may be formed which constitutes an almost insuperable handicap throughout life. Subconscious lack of confidence in himself and expectancy of proving unsatisfactory result in further blunders and an over-ready willingness to quit. Even where there is no complete failure, incapacity tends to produce a pernicious feeling of inferiority, perhaps with accompanying antagonism toward the job, the foreman, and his fellow workmen, which does further harm. Change of occupation is increasingly difficult, and if there has been a long period of training this in itself serves to discourage fresh effort. When we add to this the fact that inefficiency ordinarily carries with it friction and emotional strain, we see the desirability of ascertaining in advance an applicant's qualifications for the work into which he proposes to go.

The movement toward scientific vocational guidance began with the effort of Parsons in Boston, about 1908, to offer appropriate advice to boys graduating from the public schools. This idea was quickly taken up in other cities, which likewise appointed vocational counselors in connection with the public school system. The general method was

that of ascertaining in detail the personal characteristics of the boy or girl, both by asking questions which called for self-examination, and by obtaining the testimony of others. Careful inquiry about habits, tendencies, likes and dislikes, served to elicit valuable information. The field of employment was also clarified by a study of various industries, revealing their characteristic features, processes, wages, numbers employed, and the like. In the light of this information applicants were placed with some assurance of fitness.

All this at best was rather vague, however. It remained for the psychologist, following the same line, to analyze occupations into their psychophysical elements, to construct simple combinations of processes corresponding essentially to those of the tasks involved, and to test individuals in these respects. Such analytic and synthetic methods are now being applied experimentally in many industries. Trained observers measure personal reaction time, sensory acuity, perceptual quickness, memory span, associative habits, imaginative ingenuity, power of reasoning, and other functions, singly and in combination, with reference to the special character and needs of various occupations. Without abandoning the earlier form of inquiry or testimony based on general observation, they supplement this with precise psychological fact. This, of course, is the only really scientific vocational guidance. We shall presently consider some illustrations of its operation.

The problem is the more complex and difficult

because of the diversity of human callings, which require quite different methods of investigation. For our present purpose we may conveniently group occupations in four principal classes: first, those which are predominantly mechanical, involving the use of tools ranging from the simplicity of a shovel to the complexity of a locomotive; second, the commercial pursuits, including not only all forms of salesmanship, but also positions of business organization and direction; third, the artistic, and fourth, the more distinctly intellectual professions. These naturally overlap, of course, and accordingly some vocations might be placed in more than one group. Almost everyone has mechanical, social, and abstractly intellectual features, and also may be practised with the spirit and skill of artistry. A mechanical task may call for some mathematical calculation, legal learning is accompanied by more or less social insight, and so on. It is especially to be observed that social intelligence plays a part everywhere; hence no vocational examination is complete without inquiry into personal traits of command, obedience, and ability to work harmoniously with one's associates.

In general the possibility of definite preliminary vocational guidance is greatest in the mechanical and artistic pursuits. Qualifications and disqualifications for mechanical tasks, especially those which depend essentially upon natural psychophysical endowment, can often be ascertained with considerable exactness. The visual and tactual acuity of an inspector of machine parts, and the manual dex-

terity of an assembler, are illustrations. Similarly musicians must possess a certain accuracy of auditory discrimination, though this is of course not the most important qualification. The artistic professions depend upon powers of imagination and expression which reveal themselves in early life. For the second and fourth classes specific tests are as a rule less significant. While some of their particular features may be reduced to test form, vocational guidance must here depend largely upon general intelligence and proved moral character. These traits, however, may be ascertained more accurately by psychological methods than is commonly the case.

Analytic and Synthetic Tests.—Let us now look a little more closely at the analytic and synthetic methods of determining vocational ability. A thoroughgoing analytic test involves (1) a psychological analysis of the occupation in question into its constituent mental and physical functions, (2) the application of corresponding tests to workmen possessing different degrees of skill in the occupation, in order to obtain norms of ability, (3) the testing of the candidate in the same way, and the evaluation of results by the ascertained norms.

Reflective observation of a task usually serves to disclose its elementary processes. Thus Münsterberg analyzed telephone operation into the functions of attention, perceptual intelligence, rapidity and exactitude of reaction. On this basis he designed appropriate tests of memory span for digits, cancellation, card sorting, associative processes, apprehension of logical relationships, and certain

psychophysical measurements of speed and accuracy. For stenographers, the list mentioned by Hollingworth includes exercises in form substitution, following directions, naming opposites, color naming, and, as especially important, letter substitution. Seashore's tests of potential musical ability relate to the discrimination of pitch, perception of rhythm, musical memory, consonance and dissonance, and affective qualities of appreciation. In the army aviation tests, that of the sense of equilibrium was of course fundamentally important. In any case it is assumed that the essential nature of the occupation is correctly represented by a few simple or complex functions.

The process of determining just what ones are most reliable in this respect is, however, very laborious. It is especially to be observed that in order to ascertain standards it is necessary to correlate performance of the tests with acknowledged skill in the occupation. A test has no value unless it is well done by good workmen and poorly by others. Such correlation obviously involves independent judgment with regard to individual differences of skill, and this is ordinarily obtained by consulting office records of accomplishment, and the opinion of foremen and others who are familiar with the individual's performance. The method owes its effectiveness in part to the systematic care with which this is done. Since the correlation differs for different tests, the results must be "weighted" accordingly; one form of test may be much more significant than another.

Analytic tests are useful not only to indicate voca-

tional aptitude in advance of trial, but also to explain the incompetency of some workmen, and thus assure their replacement with others who are more efficient. In a certain bicycle ball factory, for example, one hundred and twenty girls were employed to examine the balls and pick out those which were defective. Since this operation depends in part upon rapidity of neuro-muscular reaction, the girls were tested in this respect, and those who were found to have a comparatively long reaction time were removed. The result was the reduction of the number employed to thirty-five, and a sixty per cent gain in accuracy. In consequence, "The wages of the girls were nearly doubled, the working hours reduced from 10½ to 8½ per day, and the cost of manufacture to the company considerably diminished." [1]

The so-called synthetic test differs from the analytic variety. Here, instead of reducing the operation to a few single functions which are tested separately, the method is that of constructing a composite exercise resembling the occupational task as a whole. In principle it is like the vocational model or miniature with which we are more or less familiar in various forms ranging from the hunting and housekeeping plays of children to the "vestibule school" of certain contemporary industries. In the latter the applicant is set at work at different tasks in a preliminary way, thus being given an opportunity to demonstrate what he can do best, and at the same time being trained in skill. Large offices, factories, and railway systems make use of such

[1] Drever, *The Psychology of Industry*, p. 38.

schools. The psychologist, instead of copying the actual occupation, makes a characteristic contribution to the method by artificially simplifying the combination of functions, so that it can be presented in the compact form of a test. Let us take as an illustration Münsterberg's notable experiments upon electric railway motormen.[1] He constructed diagrams representing a city street, with car track, car, and figures indicating persons and vehicles traveling in different directions. The subject by turning a crank brought several such diagrams successively into view, and thus faced a changing scene corresponding to that which characterizes the occupation. And just as the city street presents from moment to moment a variety of dangerous situations which the motorman must recognize instantly and meet in an appropriate way, so the diagrams involved certain relationships among the figures which were particularly to be observed as indicative of danger. Speed in manipulating the apparatus and indicating correctly its significant features constituted the test. Though the device was imperfect, according to Münsterberg, "the tried motorman agreed that they really pass through the experiment with the feeling which they have on their car."

Analytic tests apply principally to mechanical pursuits, or to those which consist largely of routine mental operations. In these cases the important feature is a reaction or group of reactions of a comparatively simple kind. Synthetic tests, on the other hand, are appropriate to occupations which are

[1] *Psychology of Industrial Efficiency,* Ch. VIII.

characterized by reactions to complex situations varying in their inner relationships. Such situations call for perceptual intelligence of a high order, the mental power of synthesizing numerous details so as instantly to grasp their unitary significance. It should be borne in mind. in relation to both types of test, that they ignore certain factors which are usually present in the actual occupation, and which sometimes go far to produce success or failure, such factors for example as the character and behavior of associates, the stimulus of rivalry, friendly encouragement or the irritation of being driven, home conditions, and aims and ideals which lie quite outside the circumference of the job. Even in mechanical tasks the moral qualities of determination, patience, and persistence may be of greater value than a test is likely to indicate.

In the commercial and intellectual vocations the determining factors of efficiency, apart from certain quasi-mechanical features, are of a more intangible sort. Consequently specific occupational tests are either impossible or are less significant for the purpose than those of general intelligence; and even these do not reach some of the essential traits of character which constitute ability in the occupation. It is desirable, of course, to test the handwriting and arithmetical accuracy of a prospective salesman. Tests of memory, associative habits of mind, and comprehension of directions may also be indicative of ability in a more general way. The peculiar qualities of personal address which make a good salesman, however, are not likely to be adequately

tested except in actual practice. Similarly the work of a teacher, though it depends upon thorough knowledge of the subjects taught and also upon general information, such as may be tested by examination, depends even more in dealing with pupils upon subtle personal qualities of social intelligence which can hardly be described, much less formulated after the fashion of a mental test.

General Considerations.—While specific tests of vocational ability constitute a genuine advance in applied psychology, and while the method unquestionably should receive further development, it nevertheless remains a fact that most vocational selection must depend in the future as in the past upon other and more general considerations. First in importance among these is *interest*. To be persistently interested in any subject, art, or science, is presumptively to possess some measure of ability in it. Though not absolutely reliable in this respect, it is on the whole nature's sign of power. Granted that the interest is not a mere transitory flicker or shallow fascination, but possesses permanent strength and has reference to the essential character of an occupation rather than to any merely external or superficial features, there is no better preliminary guide. It serves not only to indicate capacity, but also to energize intelligence in learning, and to carry the learner safely over those inevitable difficulties and periods of discouragement which would otherwise produce failure.

It is therefore a wise counsel of vocational psychology to give youth the opportunity of becoming

interested in various types of occupation. This may be done by observantly visiting shops and factories, newspaper plants, offices, hospitals, courtrooms, and other places where the actual business of life is carried on. It may also be done effectively through the media of moving pictures, descriptive literature, and lectures by competent occupational representatives. Under such conditions the lightning shaft of interest may be expected to strike. The writer's observation of college graduates seems to him to show that those who gave themselves such preliminary experiences, and thus became interested in this or that field, are the ones who have advanced in their respective employments with the greatest directness and momentum.

Secondly, there are certain general traits of mental and moral character which may be ascertained through the subject's self-examination or from observation by others. It is desirable to know whether a person prefers to work with his head or with his hands, and in which respect he is the more efficient; whether he prefers indoor or outdoor work, a settled job or one which involves travel; whether he likes large tasks or small ones, work which demands accuracy or work which does not need it. Further, it may be important to inquire whether he is naturally inclined to originate or to imitate, to adapt himself to conditions or to remain self-centered, to assume responsibility or to evade it. These and other individual qualities may be matched with the characteristic features of different occupations so as to facilitate a permanently satisfactory choice of life work.

Finally, let us not forget that most persons possess aptitude for a considerable variety of occupations. It is a mistake to suppose, as the literature of vocational selection would sometimes lead us to suppose, that the individual is naturally fitted for just one kind of work, and that unless scientific psychology comes to his aid it is an improbable chance that he will succeed in what he undertakes. General intelligence is the fundamental requisite for widely different forms of employment; thus equipped the applicant can enter any one of these with the assurance of being able to do the work. It is a significant fact that leaders in the technical professions are constantly emphasizing the fundamental importance of general intellectual culture, and declaring that technical efficiency can be inculcated by later training. Noteworthy also is the fact that so much of the world's great work has been done by men and women who traveled the long road of general education without being aware of the precise direction in which it was leading them. It is true, no doubt, that some persons have peculiar qualifications for excelling in a particular pursuit, but it is no less true that even genius has a remarkable versatility. On the whole, interest, general intelligence, and moral character are reliable guides in the selection of a vocation. For the more distinctly mechanical occupations and for the artistic professions specific tests serve to indicate superior ability and to eliminate the unfit.

QUESTIONS AND EXERCISES

1. Why was the psychology of industry and commerce so late in development in comparison with other branches of applied psychology?

2. Mention some facts in these fields which constitute subjects for psychological inquiry.

3. What are the principal groups of psychological problems concerning industry and commerce?

4. What factors ordinarily determine the selection of a vocation?

5. In what respects is the ordinary method of selecting a vocation unsatisfactory?

6. State briefly the general character of scientific vocational guidance.

7. What are the principal classes of occupation? How do they differ in relation to scientific vocational guidance?

8. Describe the general character of analytic tests. Describe in detail some illustration of their use.

9. What is a synthetic test? To what special types of occupation are the analytic and the synthetic forms of test respectively appropriate?

10. What factors of efficiency lie beyond the scope of such tests?

11. What is the general significance of interest with regard to vocational selection? How may vocational interests be discovered?

12. Mention some general abilities and preferences which are of importance for consideration with reference to the choice of a vocation.

13. State explicitly the relation of general intelligence to vocational efficiency.

14. Try to analyze familiar occupations so as to ascertain possible forms of vocational test.

15. Make a thorough and systematic inquiry concerning your own qualifications for different occupations.

CHAPTER XVII

INDUSTRIAL TRAINING

Skill.—The contemporary movement toward industrial efficiency involves as one of its principal features the perfection of skill. The worker must be trained to perform with precision and rapidity whatever processes constitute his work. Eye and hands must coöperate under the direction of intelligence; in fact the whole neuro-muscular system must be habituated to action in just the right way, and with its own maximum quickness of operation. In part skill consists of sheer mechanism of muscular response to stimuli; in part it is characterized by intelligent adjustment to difficulties. How great is the range of personal differences in these respects in any occupation and how far reaching is its economic significance it is hardly necessary to point out.

Every kind of work has its own forms and degrees of skill. The so-called "unskilled occupations," such as sweeping, dish washing, digging, wood chopping, and handling freight, really involve mental and muscular adjustments which are properly designated as skilful. They are unskilled only in the sense of being learned more easily and with less intelligence than other tasks. This was demonstrated by the industrial changes incidental to the war, in

particular by the difficulty of replacing satisfactorily the unskilled workers who became soldiers. Running an elevator, for example, proved to be a more skilled operation than had been supposed. It is true, no doubt, that present-day industry constantly tends to replace individual skill of craftsmanship by machinery which can be operated with less, and in some instances extremely little intelligence, and also to subdivide processes so that they become the mere repetition of simple movements. Yet in some measure skill remains an indispensable condition of efficiency, and accordingly we face the question of how it may be most easily acquired.

Learning the Work.—Psychologically, the task of learning an industrial process is first and foremost that of acquiring certain neuro-muscular habits as quickly as possible, and in such a way that they work with a maximum of accuracy and a minimum of fatigue. In the use of all sorts of tools, machines, and instruments, including those of sport, music, and pictorial art, skill consists primarily in precision of movement. Pen and typewriter, pickaxe and steam shovel, needle and loom, golf club and tennis racquet, piano and violin, all call for definite muscular adjustments. So also in the practice of salesmanship success depends upon using the right method of presenting goods, suggesting purchase, and overcoming inhibitions. In fact all those occupations which are characterized by speech and social address present the same general problem to the beginner. From our present point of view this problem may be regarded as that of learning in the most expeditious

way to make the right movements or say the right words.

In dealing with it we may conveniently use the familiar generalization of educational psychology which we discussed in Chapter VII, the classification of methods of learning as trial and error, imitation, and analysis. The processes of industrial training ordinarily involve all these in varying measure, but without sufficient use of the higher forms. The beginner, that is to say, learns by imitating someone else who "shows him how" in greater or less detail, and beyond this preliminary experience he guides himself according to his own successes and failures. The outcome is an individual method resembling that of the teacher, but modified in some particulars, e.g., position of the hands, order of movements, speed and rhythm, forms of speech, and so on. This method has the advantage of stimulating interest by actual accomplishment, and bringing the worker to the point of production quickly, but it is unsatisfactory in several respects. The learner copies his teacher's defects as well as his perfections. Incidentally, too, he acquires movement habits which are superfluous or awkward. In consequence his further acquisition of skill depends upon unlearning these bad habits, a process which is likely to be very difficult. In some cases the method results in excessive fatigue, as well as waste of time and of materials.

Scientific advance in training the worker therefore consists in the first place of facilitating the imitation of what is correct. Good examples must be carefully

selected and bad ones rejected; the copy should be examined critically and its imperfections studiously eliminated. In some mechanical arts the process is aided by photography, which permits the easy repetition of the example in vivid pictorial form. Stereoscopic slides and motion pictures are of course especially helpful in this way. In training salesmen it is desirable to have them observe experts whose forms of speech and manner of presenting goods are most effective. Competent teachers should scrutinize the apprentice's efforts and see that persistent errors are corrected before they set as habits of bad workmanship. All this is simple enough in theory, but much less common in practice than it might be. Expert teaching is not a universal art, and it is perhaps naturally less prevalent in industry than in the more distinctly intellectual occupations. Consequently there is opportunity for great improvement along the lines indicated. The general principle is that of perfecting the process of imitation so that it produces correct mechanical movements or social behavior, and reduces to a minimum the inept and wasteful process of trial and error.

In processes of industry which call for highly mechanized muscular movements the desirable method of learning is sometimes that of analyzing the operation into its constituent parts, acquiring skill in these separately, and gradually synthesizing them into a whole. To take a simple illustration, in the case of orange packing, which consists of wrapping the orange and placing it in the box, the learner might begin with the latter detail, using oranges

already wrapped, until he attained the requisite degree of speed. Next would come training in the deft movements of enveloping the orange in its coat of paper, and twisting the latter so that it "stays put." The first operation would then be superposed on the second with a minimum of awkwardness. Similarly in the more complicated process of iron molding there are such details as placing and removing the pattern, tamping the sand, and pouring the molten metal, in each of which there is need of expert skill. The defects of the usual method of learning an operation as a whole are first that it does not permit the kind of practice which produces speed and accuracy, and second that it tends to the repetition of mistakes since they are not corrected immediately. Many complex tasks might better be mechanized part by part. These parts should of course be *real* parts, i.e., such as subsequently to enter into the whole process without substantial modification. Concurrently, perhaps, there should be occasional practice in synthesis, both for its own sake and for that of sustaining interest in the job.

Finally, the learner needs to understand the theoretical principles underlying his work. Desirable as it is to know just what or what not to do, it is still better to comprehend the reason for this,—for example, why a certain pressure on a tool or careless manipulation of a machine produces defects, why a particular composition and handling results in flawless steel, why one form of advertising is effective and another repellent. Such explanatory knowledge works both positively to reënforce correct action and

negatively to prevent mistakes. It also tends to advancement in method; aided by experiment it occasionally leads to notable improvements. Business houses sometimes find that college graduates, though less inclined to imitate others in their work, seek in accordance with their higher education to understand its essential character, aims, and integral relation to the whole industry. For this reason they may take longer to adjust themselves to the occupation than do other employees, but ultimately they are able to accomplish more. It is noteworthy also that in many industries the management encourages workmen to study the theoretical principles of their tasks, and even in some instances provides schools for this purpose. It is no doubt true that skill may be acquired without intellectual learning, and perhaps also that the latter may be over emphasized to the detriment of practical efficiency. On the whole, however, it is a safe generalization here as elsewhere that knowledge gives power.

Rate of Progress, Plateaus, and Incentives.—Improvement in skill is not continuous; as we saw in Chapter VII it has various ups and downs, rapid advances and unexpected "slumps." The latter may be brief and inconsiderable, being due to external conditions which are easily changed, or to internal ones which disappear with a night's sleep. From time to time, however, the learner reaches a more protracted dead level of performance which is likely to be discouraging in its effects, and which may even determine permanently his reputation and status as a workman. Hence the phenomenon of the "pla-

teau," so much discussed in educational psychology, is also important in industry.

As was pointed out, the causes of such retardation are various. They are (1) the need of the nervous organism to settle permanently in its new method of operation before undergoing further development, (2) the incidental acquisition of bad neuro-muscular habits which offer continued interference with progress, (3) the onset of special difficulties as the work becomes finer in character and in its demand for extraordinary skill, and (4), last but not least, waning interest and enthusiasm. To some extent the retardation tends to disappear naturally with the lapse of time, so that sheer patience in sticking to the job is ultimately rewarded by a new advance in accomplishment. Occasionally it needs to be dealt with by analysis which discovers the precise character of the difficulty and so facilitates its removal. This implies much more careful criticism and instruction by competent teachers than is commonly found. Generally speaking, the beginner is incapable of analyzing his own performance correctly; not every skilled workman, indeed, can do this either for himself or for another. The problem calls distinctly for a type of industrial teacher which probably is rare. There can be little doubt, however, that this kind of instruction would pay richly for itself in quantity and quality of product.

Where the plateau arises from distinctly emotional causes it must be dealt with by inculcating fresh incentives. We have more than once observed the importance of attitude, point of view, purpose,

and guiding idea, with all their peculiar emotional coloring, as conditions of successful achievement. One's disposition with regard to his job makes a profound difference in the performance of it. Interest, cheerfulness, hope, a definite aim, a reflective ideal, serve to energize the worker. Somehow these fundamental factors of life organize the mental and physical mechanism on subconscious levels, and constantly control its operation. The distant objective of professional distinction, or the desire for pecuniary independence, or the mere liking to use machinery or to deal with men, make all the difference between success and failure. In many a case of the latter the cause is found not in mechanical inability to perform the task, but rather in the fact that the workman doesn't like his work, doesn't "take to" the job.

So it is with the learner. The natural difficulties of training and the incidental discouragement of ineptness, perhaps also ridicule or reproof, may be serious obstacles to advancement. Before he acquires skill and command of the situation he may develop a constant, partly subconscious, but very effective repugnance to his work. Especially if it is characterized by dirt and drudgery, or monotony, or unsympathetic supervision, an unfavorable attitude is likely to appear. Probably as large a percentage of abandoned apprenticeships is due to this kind of cause as to lack of intelligence or of psychophysical capacity. On the other hand we occasionally observe both in school and in industry conspicuous instances of progress determined by factors of interest and purpose. These carry the learner through

tedious routine, help him to surmount difficulties, and even suggest ingenious improvements of method. Consequently the psychological problem at this point of our study is, How may appropriate incentives be created?

The various motives which are useful in this respect, motives such as competition, increase of wages, advancement, opportunities for recreation and the like, owe their efficacy to the fact that they touch certain deep springs of human nature, those instinctive desires and tendencies of self-assertion, construction, play, family and community life, which fundamentally constitute mankind. These are the basis of that *individual and social self-development* which we may take as a guiding principle of industrial efficiency and progress. Work should lead as obviously as possible to a position of acknowledged skill, living comfort, a home, and social standing. The short-sighted attitude of so much pay for so much work is devitalizing and demoralizing; it is all but fatal to efficiency in the period of training. A good workman has larger considerations than the contents of a pay envelope.

There is one respect in which this idealism is particularly important. In most tasks there is a possibility of what we may term *artistry,* i.e., a liking for the work, a more or less original ability to do it in just the right way, and a consequent pride in accomplishment. Even the most prosaic jobs permit of some measure of this consciousness. It is a subtle trait of mind, perhaps rarely realized in actual employment, yet exceedingly significant; so

much so; indeed, that the ideal of it should be presented explicitly to the beginner. The disposition merely to "get by" so easily besets all apprenticeship that express effort is needed to displace it and inculcate the higher aim of the artist. No means of doing this is more effective than appreciation. Few men can do their best work when others are indifferent. We are essentially beings who want to be appreciated, and there is no part of our life in which this desire manifests itself more forcefully than in our efforts to learn. That careful teaching which we have emphasized as a vital factor of industrial efficiency involves the readiness to reward accomplishment with appropriate recognition and praise.

These higher motives of "self-realization," as they are called in ethics, produce efficiency just as genuinely as does technical training. Organized and deepened, they become subconscious sources of skill, expressing themselves in attention, precision, ingenuity, patience, and other features of good work. Industrial training should cultivate them methodically. The duty of doing so rests equally upon the apprentice and upon his employer. The former's interest in his work and the latter's interest in the worker are interdependent. It is a sad feature of much modern industry that its magnitude and mechanization so completely obliterate this relationship.

QUESTIONS AND EXERCISES

1. What is "skill"? Show in detail that an "unskilled" occupation really involves some degree of skill.

2. What is the psychological problem of learning an industrial process? Mention illustrations in different fields of industry.

3. What is the ordinary method of learning? What are its advantages? In what respects is it unsatisfactory?

4. What is the correct method? Show how the ordinary process of imitation may be improved, and how it may be aided by modern devices.

5. Explain the nature of "analytic learning." Give an illustration of a process which might be learned in this way.

6. Show clearly why it is desirable to study the theoretical background of one's work. Indicate some kind of work, with which you are familiar, the learning of which is improved by such knowledge.

7. What is a "plateau" in industrial training? Give some definite illustrations.

8. Why do plateaus appear? How, in general, should they be dealt with in order to overcome them?

9. Explain the importance of incentives in relation to industrial training. What incentives are especially powerful?

10. What is "artistry" in work? How may it be inculcated?

CHAPTER XVIII

EFFICIENCY OF OPERATION

The Idea of Efficiency.—Within the field of industrialism there has been a development, amounting in some of its phases almost to a revolution, through the application of the idea of *efficiency*. This idea has affected not only the selection of applicants for employment, and their occupational training, but many other features of present-day industry as well. In order to increase productiveness, industrial managers aided by experts have subjected the processes of business and manufacture to careful scrutiny. They have found that these processes, both in the factory and in office work, suffer from lack of standardized "technique." The worker makes unnecessary movements, imposes excessive physical strain upon himself, and is hampered by distracting stimuli and other environmental conditions, with the result that he becomes fatigued, wastes time, energy, and material, and altogether accomplishes less, both in quantity and quality, than he is capable of doing. Accordingly the "efficiency engineer" has adapted tools and machinery to individual uses, has perfected the routine of operation by simplifying and mechanizing the processes involved, has altered conditions of illumination and ventilation, of activity and rest,

and has instituted numerous novel details of "scientific management."

These matters often involve considerations of a distinctly psychological character. Since work of all kinds consists largely of perceptions and responses which are determined by psychophysical conditions, an exact knowledge of the latter is obviously requisite for efficiency. Special studies are necessary in order to determine the precise methods which are most satisfactory. In dealing with some of the problems investigators have displayed an extraordinary refinement of scientific procedure, and have made use of the special apparatus of the psychological laboratory.

Though the results of this movement have in general been beneficial, there can be no doubt that the idea of efficiency has been somewhat overworked. Its rapid spread has incidentally included much superficiality and nonsense. It has served to impart an appearance of dignity to shallow criticism, to follies of management, and even to blind and ruthless injustice. Unwisely imposed upon individuals who were better left to their own devices, and crudely imported into tasks which involve subtle conditions of human nature as yet beyond its understanding, it has occasionally stultified itself. Especially in work which calls for ingenuity, novelty of conception, and creative insight, its formulas are likely to prove a hindrance rather than a help. These traits do not work according to rule and regulation. It has also tended to ignore certain deep instincts of the worker's being, and has sometimes run counter to his ambitions and his moral interests. By mechanizing the

work it has seemed to turn the individual himself into a machine, and so has invited his antagonism, the more because he saw the major part of the increased profits of his labor kept by his employers. Many of us have not only had our ears wearied by reiteration of the term; we have come deliberately to the conclusion that there would be less friction, more happiness, and ultimately greater accomplishment if we were not subjected to the dictates of so-called efficiency.

Yet the importance of the idea cannot be ignored. Mankind is subject to economic laws hardly less mechanical in their working than the laws of inorganic and physiological nature. Inefficiency brings inevitable penalties, and anyone who disregards its principles does so at great risk. Contemporary industry is being driven by inner and outer necessity toward a goal of economic productiveness. This truth is the more impressive in view of the stupendous waste and renewed competition resulting from the Great War. Payment of the gigantic bill depends upon efficient production, and those who cannot take their part successfully in the long task must suffer in some degree the consequences of their incapacity. Slight disregard of skilful technique may make the difference between success and failure. Collective indifference or organized hostility to proper methods brings painful economic and social readjustments, such as the substitution of other products which can be made more cheaply, or uncertain and sporadic employment. Whether we like it or not, the ideal of efficiency holds us to some ex-

tent in its power. Hence we cannot afford to treat the conception as negligible, no matter how absurd may be some of its pretended applications. The current evolution of industry must be in large measure intensive, a development of internal efficiency.

The topics which we have to consider fall into two main groups, according as they relate to the *mechanical conditions* and the *social and moral factors* of efficiency. Though the two groups are not entirely distinct we may put the matter briefly and with sufficient accuracy by saying that in the first case efficiency results automatically from the establishment of certain physical and physiological conditions, such as regulated repetition of movement, appropriate pauses for rest, proper illumination of the work, and freedom from distractions. In the second case it is more distinctly the expression of the worker's will, in response to certain incentives such as wages, various comforts of life, and a voice in the direction of his labor. Factors of the first sort, constituting the "technique of operation" are discussed in this chapter.

Psychophysiological Principles; Economy of Movement.—An industrial operation, like any other action, consists of a more or less complicated psychophysical response to stimulation. Whatever the degree of complexity of the task, form of tools, or kind of materials used in it, the worker is continually making perceptual reactions in the execution of purposes. Hence the problem of industrial efficiency, broadly stated, is that of increasing speed and precision of movement and at the same time reducing its fatigue

effect. The whole history of industry has tended somewhat unwittingly in this direction. The invention of machinery utilized the forces of nature in such a way as to magnify human power tremendously, while replacing the somewhat clumsy use of large muscles by more skilful movements of smaller ones. Thus the bow and the rifle exceeded the throwing range of the arm, club and trip-hammer hit a harder blow, wagon and freight train carried a heavier load, and so on. Subdivision of tasks and the habit-forming capacity of the nervous system combined to produce quickness and accuracy, since precisely the same movement repeated without variation leads to marvelously rapid accomplishment. Various rhythms of action, as in paddling a boat, or the alternative use of hands and feet with levers and pedals, or of fingers in touching the keys of a typewriter, facilitated the neuro-muscular processes and diminished fatigue, as did also the methodical alternation of work and rest in short periods.

Scientific psychology can only continue the development along lines already laid down. It can do this effectively, however, since the refinement of its methods greatly surpasses ordinary observation and practice. The conditions of modern industry are far from perfection in point of technical efficiency. Probably it is no exaggeration to say that most industrial processes might be improved from fifty to one hundred per cent. In many cases psychological study is the only means of attaining such improvement. It serves to ascertain the most satisfactory form of tools, location of machines and materials,

type and frequency of movement. By exact measurement it determines the effectiveness of different complications of stimuli, and the degree of fatigue resulting from various methods of performance. When we add to these problems numerous others relating to environmental conditions and moral influences, we see that the psychologist has a large and fertile field for investigation.

Sometimes a considerable improvement may be secured by a slight modification of implements. The investigation by Taylor at the Bethlehem Steel Works, for example, showed that if different sizes of shovel were used in handling different materials, such as coal, ore, ashes, and slag, each shovel carrying a standard load of its special sort, the amount of work done was greatly increased, and with less fatigue than formerly. Similarly the adoption of a new machine or a filing device increases speed and accuracy. In many industrial operations the stimulus is complex, and calls for discrimination and synthesis; in other words the worker reacts to a "situation." Just what to do at a particular moment depends upon various factors such as the quality of material, relation of parts, and the result of the preceding movement. Since the mental processes involved take time and are likely to err, it makes for efficiency to provide them with mechanical aids. In processes which involve counting or measurement the invention of mechanical devices to perform this function accurately is almost uncanny; a bell rings as every tenth piece issues from the machine, or the cutting tool automatically stops when it has reached the

proper depth. In all these cases the aim is to adapt implements to the mind of the worker, either simplifying his mental processes or enabling him to act with greater precision.

An especially fruitful branch of applied psychology in the field of industry has been the so-called "motion study," i.e., the detailed investigation of particular bodily movements involved in work. Critical analysis of familiar manual operations not infrequently reveals superfluous motions, or awkwardness which may be methodically metamorphosed into skill. Where heavy articles are transferred by hand from one position to another, the arrangements should be such as to minimize the number of steps taken, the amount of reaching, bending, and lifting, and to use gravity as much as possible. The disposition of store supplies, office appliances, and kitchen utensils often calls for readjustment in this respect. Housewives commonly suffer much unnecessary fatigue because of ill planned kitchens. At first thought this simple sort of consideration may not seem to deserve the designation of applied psychology, but we should remember that the grasp of psychophysical conditions and the measurement of psychophysical effects, however untechnical in form of expression, is genuinely psychological.

Especially far reaching has been the tendency to subdivide processes into parts which may be performed with a minimum of mental effort. In extreme cases the worker cuts, punches, marks, pastes, or merely places a steady succession of pieces in a certain position, over and over again, with no more

complex stimulus than the automatic appearance of the next piece in front of him. Intelligent synthesis, even discrimination and the possibility of error, are all but eliminated. The monotony of such employment is almost insufferable, but those who can endure it accomplish wonders of rapidity and precision. Of course the simpler the action, the less energy it requires, and accordingly the less fatiguing it is. The worker in one of these minutely subdivided occupations may become extremely weary of it, but his physical fatigue in relation to the total amount of his movement and accomplishment is less than if these were of a more complex character.

Efficiency of movement is also increased by rhythm. We may note as a significant psychophysical principle that rhythmical motions have the advantage of a "continuous impulse," i.e., the stimulation of each response "carries over" in some measure to the next, and so on, with a minimum of repeated mental effort. This is another great saving in point of fatigue. Under these conditions astonishing rapidity is sometimes attained, as when an expert worker by introducing smooth rhythms into the process fills hundreds of boxes or pastes thousands of labels in a few hours. Instrumental music by artists clearly illustrates the psychological principle that a prodigious number of distinct movements may be performed without fatigue by a neuro-muscular organism which is habituated to rhythm.

The perfection of mechanical efficiency consists largely, therefore, in the reduction of processes to movements which are simple, repeated and rhyth-

mical, rapid and accurate. These characteristics are further illustrated by the carpenter's use of tools, the skill of the typesetter, deftness in box-making, food-packing, and hundreds of similar occupations. Gilbreth's remarkable photographic studies of movement lines in various kinds of work and play show with beautiful clearness the easy grace of motion which characterizes the expert. Such analyses may be used, as has already been pointed out, to perfect the process of learning. Individuals differ naturally, however, in their capability of motor efficiency. Particularly in point of speed they show, beyond a certain rate, a sharp decline in precision. "Every muscle group," says Münsterberg, "has its own optimum of rapidity for the greatest possible accuracy." Accordingly many persons must be regarded as incapable of the swift movements demanded by certain forms of contemporary industry.

An excellent illustration of the value of motion-study is found in Gilbreth's experiments with bricklaying. This expert analyst observed that eighteen separate movements were made in the process, some of which were entirely unnecessary. He eliminated the effort of repeatedly taking a step and bending by having the bricks and mortar placed on a table beside the worker. The latter was taught to pick up the brick and the trowel of mortar with simultaneous instead of successive movements, and to use a slight pressure instead of tapping each brick in place. The preliminary turning of the brick to bring the proper face outward was eliminated by having all the bricks deposited in a certain way on the table, ready for

use without turning. By these methodical improvements he reduced the number of necessary movements to five, and thus increased the rate of laying from one hundred and twenty to three hundred and fifty bricks per hour.

Typewriting presents an interesting group of problems for the psychologist to solve, problems which are obviously important because of possible economies involved. What are the relative advantages of the double keyboard, single and double shift types of machine? What is the effect of visibility of writing as an undesirable distraction of attention from the copy? Ought the keys to be at the points where the fingertips naturally fall instead of in straight rows? What should be the arrangement of letters in order to produce the smoothest succession of finger movements? Answers to these and similar questions depend in some degree upon individual differences, since the mental effort involved in the shift is greater for some than for others, the dependence of the writer upon what he has just written likewise varies, and so on. In any case, however, the answers must be sought by experimental methods, and may be stated in psychological terms of the "compound reaction," i.e., the complex stimulus and varied response.

Fatigue, Routine, and Monotony.—The mental burden of industrial fatigue, and its far-reaching consequences with regard to productiveness and safety, constitute a problem of the first magnitude. Its physiological phonomena are shown by anatomical investigation to be changes in the structure

of the cell and the accumulation of waste products in the muscles, conditions which interfere with bodily effort and which underlie the mental state. It is a question, indeed, whether fatigue is not essentially physiological—whether, in other words, so-called mental fatigue is not rather the fatigue of the nervous system, or the nervous effect of muscular overstrain involved in attention. Fatigue is a natural accompaniment of work, and in moderate degrees is desirable, since it leads to rest and renewed growth. Individuals differ greatly in susceptibility to it, and thus are permanently differentiated in productive capacity. This consideration, by the way, introduces some difficult questions as to the possibility or justice of uniform wages. When we add to these questions others concerning individual and public safety and morals, which have their roots partly in the experience of fatigue, we appreciate the extent and depth of the problem.

Under ordinary conditions of health the organic sensations of weariness are sufficiently reliable evidence of the reality of fatigue, and mentor for the cessation of work. Not always, however; for sometimes they are illusory in character. In fact we are compelled to distinguish between *real* and *false fatigue*, the latter being an abnormal exaggeration of the feeling of weariness, or a mere "fatigue memory," a mental reverberation of past experience. Some persons suffer far more from "that tired feeling" than is warranted by their exertions, and habitually misinterpret their own neurasthenic condition of disappointment and boredom. Others are so insensible

to fatigue that they are capable of astonishingly protracted effort. In the more strenuous occupations such as mining and logging, and in hunting and mountain climbing we find individuals displaying prodigious endurance, and the same is true, though in less conspicuous ways, in some forms of woman's work. Physiological constitution and mental inclination combine to produce unwearied persistence.

The great inhibiter of fatigue, both genuine and spurious, is *interest*. One who enjoys his work or sees that it leads to the fulfillment of his desires is enabled to stick to it continuously with comparatively little weariness. Powerful motives of affection, ambition, and loyalty operate in the same way. One labors tirelessly for those whom he loves, or for the attainment of a supremely important goal. The zeal of war work carried men and women through stretches of daily toil which under other conditions would have seemed impossible. On the other hand, an uninteresting task is likely to be very fatiguing, unless it is highly mechanized or relieved by frequent intermission of rest. The effort of attention in conflict with inner impulses and outer distractions rapidly exhausts one's reservoir of nervous energy. For this reason industrial workers should be freed from external disturbances which tend to fatigue the attention, and should be provided as far as possible with incentives which vitalize their labor.

One of the principal effects of fatigue is unsteadiness of attention, which makes it an exceedingly dangerous condition in relation to the highly speeded and powerful machinery used in much modern in-

dustry. Momentary diffusion or wandering is likely to result in shocking consequences,—cut, crushed, or burned flesh, the loss of limb or eyesight, even death. Statistics of accidents in factories show that they occur most frequently at those hours when fatigue is most felt, ten to eleven in the morning and three to four in the afternoon. Subsequently there is a slowing down which tends to counteract fatigue effects, and thus to lessen the likelihood of accident. Not only the safety device, but also rearrangement of work periods is sometimes requisite to guard against the human tendency to blunder through relaxed attention. In many industries hours of labor should be reduced to insure greater safety. It has been definitely shown that such reduction, down to a certain point, is quite compatible with sustained or even increased productiveness, since the diminished burden of long hours induces a more efficient state of mind and habit of work as well as lessens the economic expense of accident. In some occupations, for example those of the locomotive engineer and signalman, the safety of many persons depends upon unerring perception, which function of course is intimately correlated with attention and thus with fatigue. More than one railroad disaster has brought to light the fact that the trainmen had been continuously on duty, under conditions of abnormal nervous strain, for so many hours that attention failed at a critical moment, and the train was wrecked. Railway management, on its own initiative as well as under labor union pressure and legislative requirement, has been at pains to reorganize

working conditions so as to eliminate danger of accident due to fatigued attention.

It is an important law of fatigue that *the time required for recuperation increases more rapidly than does the fatigue itself.* An extra hour of work after a hard day calls for a much longer additional period of rest. When real fatigue begins, continued exertion so affects the bodily organism that the opportunity for recovery must be protracted in geometrical rather than arithmetical proportion, and unless there is such recovery the subsequent capacity for work is small. One may so tire himself out by unremitting effort during the first part of the day that his later performance amounts to comparatively little, and his total accomplishment is less than it should be. The inevitable overstrain incidental to emergencies ought to be followed by an appropriately lengthened vacation; otherwise the return to work shows permanently diminished power.

Though these facts and principles have long been known, their full significance has not been appreciated until recently. It has now become clear that work should be so arranged in detail that every effort is followed by a proper period of recuperation. When this is done, the steady progress, even though at a slower rate than is natural at first, results in greatly increased performance. Thus Taylor, by methodically regulating the movements of pig-iron handlers, interposing a carefully determined rest interval after each successive lifting, raised the average performance from 12½ to 47½ tons per day without increase of fatigue. It appeared that with a normal load of

90 pounds the laborer ought not to be actually working more than 43 per cent of the total working time, and should be without load 57 per cent. In other forms of labor likewise the regular alternation of measured effort and recuperative interval produced astonishing results. "Routine did it." Doubtless in all the innumerable variety of tasks which consist of repeated movements of the same character, the methodical establishment of a working routine would substantially increase production. The possible application of this principle in the everyday life of the student is noteworthy. One can accomplish a great deal by maintaining steadily a routine of two-hour study periods in afternoon and evening in addition to the morning work.

The subject of routine brings us to another topic of psychological importance in industry, that of monotony. As has already been indicated, the tendency of contemporary industry is to subdivide operations into minute parts which are so mechanized as to call for little intelligence, and to be performable with great rapidity. Thus the worker cuts, folds, stamps, packs, or feeds a machine hour after hour, all day long.[1] Needless to say, such stereotyped tasks run counter to human nature, which desires a certain amount of freshness and novelty in its work, and finds the everlasting repetition of the same tiny performance insufferably monotonous. Most per-

[1] As a typical illustration, a European immigrant butcher, who could perform the whole operation from killing the animal to dressing the hide, went to work in a Chicago packing plant, and ultimately found himself making a single chop all day long, as a moving table brought successive pieces of meat before him. His stroke was perfection in point of accuracy, but what wonder that his plaintive comment on his work was "My job is so d—— little.!"

sons want to see their work *grow*. Here as elsewhere, however, individual differences are noteworthy. The same task may be tedious to one and continuously novel and stimulating to another. The difference, according to Münsterberg, is not that the first perceives resemblances while the second does not; in fact his investigations seemed to show that those who perceive repetition most dislike it least. The basic psychological principle appears rather to be that "Some minds exhaust their energy for a particular function in carrying it out once, and therefore prefer change. If they are forced to repeat the first action it needs a steadily growing effort which becomes intolerable. But there are others with whom going through the action once produces a setting which prepares for the repetition, and makes it more natural, more pleasant." [1] It is not impossible that psychological tests may serve to discriminate between those who are naturally fitted to perform a monotonous operation and those who are not. Frequency of rest and recreation periods and the cultivation of incentives also help to lessen the tedium of monotonous employment.

Environmental Conditions.—Industrial efficiency also depends upon a wide variety of environmental conditions which in different ways facilitate or hinder psychophysical activity. Particularly important are light, sound, and temperature. These take conscious or subconscious effect upon the worker's attention to his task, and thus bear upon the problems of skill and fatigue. The aim of efficiency is to regulate

[1] *Psychology, General and Applied*, p. 426.

them in such a way as to prevent distraction of attention, since this tends to lessen accomplishment, produce discomfort, and increase the danger of accident. It is true, as experiments show, that a slight amount of distraction may have the effect of stimulating and concentrating attention upon the task, as the worker deliberately or automatically strives to overcome the difficulty; but even here the result of continuous or repeated distraction is to use up nervous energy and ultimately to produce fatigue. In general the effect is disintegrating. Especially is it desirable to arrange work which calls for highly reflective intelligence, or for accurate adjustments in order to prevent personal injury or material damage, so that it is as free as possible from the untoward influence of distraction.

With regard to illumination, the first requisite is a sufficient degree of intensity, as reflected from the object in focus, to create a distinct retinal image. The effort to fixate objects in dim light may be successful in avoiding mistakes, but produces harmful eyestrain. Hence the proper placing of machines, tables, and desks in relation to the sources of illumination is exceedingly important. Secondly, the surrounding field of view should not contain points so brilliant that the pupil of the eye automatically adjusts itself to them rather than to the luminosity of the object, and so fails to see the latter clearly. This difficulty of vision is illustrated in an extreme form by our momentary blindness to other things beside the dazzling headlights of an approaching automobile. Similarly a window or bright lamp in front

of the worker renders his vision of other objects dim, and accordingly he should protect his eyes from the direct rays by a shade. Evenness of illumination is desirable; sharp light contrasts are to be avoided except in so far as they are necessary to throw the work into relief. Diffused daylight is better than the intensity of high powered artificial lighting; a brilliant arc lamp in the periphery of the field is especially pernicious. In general a uniform brightness tends to produce cheerfulness which makes for efficiency. An investigation by Dexter showed that rainy and cloudy skies affect intellectual work unfavorably, increasing the frequency of inaccuracies. Yet with some individuals occasional dull and rainy days facilitate work by reason of their restfulness and freedom from irrelevant stimulation.

In this connection we may note that the movement of objects and especially of persons in the field of vision has the same instinctive effect of attracting attention as does a bright light or a sudden noise, and hence should be eliminated except as it is necessary to the work. Visitors in factories almost inevitably constitute so interesting a distraction to the operative that their presence is usually unwelcome to the management. The tide of life in busy streets must sometimes be shut out by ground glass windows. In summary, the principal evils to be avoided, with regard to vision, are an insufficient or excessive stimulation of the retina, overstrain of the muscles of accommodation and convergence, and the interposition of objects of irrelevant interest.

Noise, generally speaking, is a nuisance to the

worker, though it is of course unavoidable in many kinds of industry, and one may become so "adapted" to it that it produces no conscious effect. If it is such as to excite attention or beat upon the ear it may become painfully fatiguing, or even an intolerable torture. Quiet surroundings are best for work, especially that which involves intellectual processes. Rhythmical sounds are particularly interesting from a psychological standpoint. If the rhythm coincides with that of the task itself it tends to facilitate the latter in regularity and energy, as the auditory stimulus reënforces the muscular movement. Marching to music is a simple illustration. So also sailors pulling on a rope or pushing capstan bars increase the effectiveness of their effort by their rhythmical "*heave*-ho" or "*all* together." A cannery worker once told the writer that the rhythmical slap of a near-by belt helped her because its interval happened to be just sufficient for cutting two apricots. Irrelevant rhythms are exceedingly trying, however, since they constitute a stimulus which tends to produce an automatic response in conflict with the movements of the work itself, and thus engenders nervous strain. Under such conditions the periodic exhaust of a steam pipe, for example, may become insufferable.

Music has a somewhat uncertain value in relation to industry. Its rhythm may be helpful, and when rightly chosen it may produce an atmosphere of cheerfulness and a mental response in the worker which makes for efficiency. This is especially true if it leads to singing;—"Give me," says Carlyle, "the

man who sings at his work!" Phonographs have been deliberately introduced into some work shops for such purposes. On the other hand it may distract attention, though perhaps this effect is negligible in consideration of its emotional significance. Similarly with respect to conversation, we must recognize its social and recreational value, and the fact that it may produce a mental disposition which is directly favorable to accomplishment. It is practically impossible to enforce silence among workers. Nevertheless conversation generally illustrates in some degree the principle that "simultaneous independent activities always disturb and inhibit one another." Alteration of the position of seats, benches, and machines in such a way as to lessen the ease of conversation sometimes results in a considerable increase of efficiency.

Appropriate conditions of temperature and ventilation are also to be noted as important. Experimental studies confirm the familiar idea that a constant supply of fresh air at a temperature of about 68° F. is most favorable for mental and physical effort. Extremes of heat and cold, humidity and dryness, rapidly depress the worker's energy. Ventilation is peculiarly essential; a much higher temperature and humidity can be endured if there is circulation of air. In some industries there are "occupational odors," e.g., those of the tannery, sugar, and fertilizer factories, which are so disagreeable as to be almost nauseating. The operative quickly becomes adapted to them, however, though perhaps they continue to exert subconsciously a somewhat

depressing influence upon his work. Doubtless the dust which is characteristic of some occupations has bad mental consequences in the worker's attitude as well as harmful physiological effects. In all these matters the psychological principle is the same. Whatever environmental conditions produce an affective tone of unpleasantness in the mind of the worker must be regarded as objectionable.

In addition to the foregoing environmental conditions there are numerous others which directly or indirectly affect efficiency. Drugs and stimulants are especially deserving of mention—tea, coffee, tobacco, and alcohol, in particular—since their psychophysical effects have been studied experimentally with much care. Unfortunately the results are so ambiguous and conflicting that it is hardly worth while to present a statement of them in detail, but certain general conclusions may be stated with assurance. (1) These substances have temporarily a stimulating effect which under certain conditions may be helpful; ultimately, however, except perhaps in very small doses, they act as depressants. (2) Personal differences of susceptibility, particularly in relation to the size of the dose, are so large as to make generalizations unreliable. (3) Their effect is partly due to suggestion. When the individual does not know what he is taking the reaction is diminished. (4) The emotional and social effect produced by moderate indulgence is so agreeable that they cannot simply be condemned. Within limits they have a useful, though by no means an indispensable function. Many persons would be better off without

them, and their general relation to efficiency is unfavorable.

The case against alcohol has been established scientifically with considerable exactness. Its effects upon the psychophysical functions employed in industry are unquestionably bad, at least in the quantity of ordinary consumption. The feeling of increased power which it gives is illusory, and its lessening of scope and accuracy of attention, perception, memory, and judgment constitute valid grounds for outlawing its use where, as in railroad service, public safety is concerned.

QUESTIONS AND EXERCISES

1. Define "efficiency." In what respects are the processes of mechanical industry often inefficient?

2. Explain the importance of industrial efficiency. What dangers are there in the application of the idea?

3. State the general relation of psychology to industrial efficiency.

4. Show by psychological analysis of particular cases how the modification of implements conduces to efficiency.

5. What is "motion-study"? Explain in detail why it is important.

6. Show by illustration how efficiency may be increased by eliminating unnecessary movements, subdividing processes, and using rhythms.

7. What is fatigue? Distinguish between real and false fatigue.

8. How is fatigue inhibited? Mention illustrations from different phases of life.

9. What are the principal causes of industrial fatigue? Show why it is especially dangerous.

10. Show clearly the relation between fatigue and the time

required for recuperation. Show in detail what this implies with regard to industrial routine.

11. What is the mental basis of "monotony"? In what way can psychology help to relieve the problem of monotony in industry?

12. State some of the psychophysical principles of vision which bear on the problem of illumination as a factor of efficiency.

13. Show psychologically how noise, music, and conversation are related to efficiency.

14. Show how efficiency depends upon atmospheric conditions.

15. What are the general results of experimentation with regard to the effect of drugs and stimulants in relation to efficiency?

CHAPTER XIX

SOCIAL AND MORAL FACTORS

Industrial Discontent and Its Causes.—It is a paradoxical fact that the contemporary movement toward industrial efficiency has been accompanied by tendencies working in precisely the opposite direction. Not only has there been suspicion of and resentment against the movement—in some instances the introduction of its methods has been openly and forcibly resisted; but in a more subtle way the mind of the worker has become saturated with a discontent which makes against it. This state of mind crystallizes at definite points of dissatisfaction, such as wages, hours of labor, and the refusal to "recognize the union," but its pervasiveness extends far beyond these matters. Its outward and visible sign is often the strike, but much more sinister is the "striking on the job," i.e., scamping the work in one way or another, and using individual cleverness to conceal deficiencies, or the power of industrial organization to defy punishment. How efficacious this may be in limiting output appears clearly in the comparison of efficiently and inefficiently administered shops. In an instance which recently came to the writer's attention, the same job, a piece of heavy machine work, took more than twice as long in one case as in

the other. It is not too much to say that innumerable workers in all kinds of industry are actuated consciously or subconsciously by a determination to give as little labor for their wages as is safely possible.

The immediate ground of antagonism to industrial efficiency is the laborer's unwillingness to work harder for another's profit. The reply that he does not work harder in the sense of undergoing greater fatigue fails to meet his objection because it proceeds from a different point of view with regard to what is fair. Under a régime of efficiency he is compelled to turn out a much larger product, yet he receives only a part, and it may be only a small part, of the increased returns. For example, in several recorded instances an expansion of three or four hundred per cent in output was rewarded by an advance of fifty or sixty per cent in wages. Whether or not this is really unjust, its suggestion of injustice is obvious. Adding to it the consideration that increased efficiency commonly results in reducing the number of workers, with the suffering usually involved in loss of employment, we cannot fail to understand the apprehensiveness with which "efficiency methods" are regarded by labor.

Other motives of a more subtle but not less powerful character operate against efficiency. Especially important are those which result from the widening separation of employer and employee, due to the tremendous expansion and organization of contemporary industry. Formerly a somewhat familiar relationship existed, with personal acquaintance and

sympathy on the part of the owner, and loyalty or even affection in those whom he employed. He called them by name, helped them in times of trouble, and in some measure gave their work his own critical supervision and approval. This paternal relation has largely disappeared. Ownership is so subdivided and removed from actual contact with the work that quite naturally its interest has become exclusively that of gain. The "boss" is manager or the foreman, whose business it is to maintain production, and whose function of enforcing unwelcome rules wins contempt for him as the tool of tyranny. At worst the worker becomes a mere unit, in some cases hardly more than a number on the books, to be hired or discharged without the least regard for his own welfare, daily fatigued to the point of exhaustion, and when disabled by age or injury "scrapped" like any other useless part of the mechanism. Under such conditions motives of loyalty disappear with the loss of personal standing, and the disposition on both sides becomes that of getting as much and giving as little as possible.

A peculiarly fundamental source of dissatisfaction lies in the nature of efficiency itself. This, as was pointed out in the preceding chapter, consists essentially of mechanization, the reduction of processes to simple movements which can be repeated rapidly, and which call for a minimum of intelligent decision on the part of the worker. Yet the latter is not a machine, and he objects strenuously to being treated as one. Everybody naturally tends to identify himself with his work. His self-consciousness as a per-

sonality stands in vital relation to the size of his job, its scope as a part of a larger whole, and its possibilities of development. These grounds of self-respect are in large measure removed by the extreme subdivision and routine of labor. The difficulty is not simply that he has to work harder, or thinks he does; it is that his work is rendered devoid of freedom and spontaneity. Self-formed purpose, choice of method, pride of accomplishment are blotted out by the overpowering demand for conformity to rule. One can mechanize himself contentedly for certain purposes of his own, and can even take pride in doing so, but the external imposition of mechanical ways, refined to the last degree of monotony, runs against instincts of selfhood which are exceedingly powerful.

The sentiment of antagonism to efficiency is accentuated by manifest social and economic inequalities, by the ostentatious display of wealth with its seeming ease of life in contrast to the hardships of daily toil, and by the real or apparent lack of opportunity to achieve economic independence. The Great War has unsettled the stability of society, weakening habits of docility, overthrowing traditions of governmental authority, spreading ideas of democracy, and raising afresh age-long questions about individual rights and the ultimate worth of life. Ideas and emotions concerning the injustice of the present social order are communicated sympathetically throughout the ranks of labor; they are rendered articulate by a powerful labor press and other "literature of discontent," and become active in the organization of labor unions. Strikes, it is

true, commonly turn upon points of wages and hours, or the acknowledgment of unionism, but underneath the immediate causes of dispute are strong instinctive forces of human nature, self-assertive, acquisitive, pugnacious, rebellious against injustice. Deep and powerful are the mental factors which the dynamic pressure of the unsatisfied will increasingly arrays against industrial efficiency.

There are many who see this situation only in terms of inevitable conflict. In their view the interests of the worker and of those for whom he works are essentially and unalterably opposed. On the one side are the persons belonging directly or indirectly to the so-called capitalistic classes, who look upon labor not only as socially inferior, but as properly subject to the economic domination of its employer, who extracts such profits from its toil as he can, and determines its wages to suit himself. Its principal virtues are submissiveness, industriousness, and thrift. If a few can individually win their way upward, their success will ultimately receive a measure of approval; but for the mass there can be no such opportunity. In general its traits of character and intelligence are of a low order. Laziness and stupidity are to be expected; efficiency can be imposed only by external authority.

On the other side is the equally partisan view of innumerable wageworkers who feel their plight to be hopeless unless they can attain their ends by shrewdness and force. Work is for them an evil to be lightened in any way possible, but principally by clever evasion and organized threat. Efficiency,

which means additional work without due pay, is to be avoided.

It would be foolish to minimize this antagonism, but nevertheless it need not be treated as inevitable. The foregoing statement shows that the difficulty may be regarded psychologically as having its roots in certain tendencies of human nature, instinctive and imitative, which the present organization of industry and of the society in which it is embedded calls into maleficent operation. But there are other tendencies, no less deep and forceful, which work in the opposite direction. Instincts of constructiveness, emotions of sympathy, sentiments of respect and habits of coöperation are traits of character quite as genuine and fundamental as those which produce industrial discord. Indeed the latter often need only to be guided properly in order to become helpful. Hence the problem which emerges is that of discovering the inner motives of efficiency and establishing the external conditions which naturally call them into play. These conditions and motives we may designate as the "moral factors" of industry, meaning by the term whatever acts upon the will of the worker, not only encouraging him to endure his lot, but stimulating him to do his best. Three distinct lines of effort may be noted, namely *wage methods, philanthropic measures,* and *systems of coöperative control.*

Wage Methods.—The psychology of wages turns mainly upon the relative advantages and disadvantages of the two principal methods of payment, by the time—hour, day, or week—and by the piece.

Of course there are many occupations in which only one of these methods is practicable; but in numerous industries either may be used, and there are various possible combinations of them. The general development of modern industry and in particular its tendency to subdivide and routinize processes enhances the importance of the problem, not only because profits often depend in no small measure upon the form of payment, but also because the monotonous or disagreeable character of the work gives the wages additional compensatory significance. Progress aims at finding a way of combining the benefits and eliminating the evils of the two methods.

The time-rate has the advantage of steadiness. It gives elasticity to the organization of work by permitting the individual to engage in a variety of tasks within the specified time. It frees his mind in some degree from concern about his earnings, since these are predetermined, and thus makes it possible for him if he desires to pay attention to the finer quality of his work, not sacrificing this to sheer quantity. Likewise it prevents unfair discrimination against the less rapid worker, and diminishes the discouraging effect of conscious inferiority. On the other hand it encourages slowness, waste of time between jobs, and in many persons indifference to quality as well as quantity of performance. The piece rate obviously constitutes a constant stimulation to speed, and so becomes a tremendously important factor of efficiency. It appears to give just compensation to extra effort. Superior ability, too, usually feels that

it is naturally entitled to corresponding rewards, and hence is inclined to favor it. But in many cases it conspicuously makes for quantity rather than quality of product, and its moral effects are decidedly dubious. It operates, sometimes cruelly, to speed up workers in competition with one another, and to eliminate the less capable in a ruthless fashion. Its intensification of nervous strain leads to varied troubles of mind and body, including fatigue, jealousy, and dishonesty. The large earnings which it makes possible in exceptional instances conduce to irregularity of working hours and incidental bad habits of other sorts. In the minds of many workers who suffer from its rigidity it tends to inculcate a dangerous conviction of the essential injustice and tyranny of the industrial order.

Investigation has revealed interesting examples of deliberate limitation of output under the time-rate system, as the laborer shrewdly decided how much, or rather in some instances how little he could safely do for a day's work,—a state of affairs which, of course, must inevitably lead to the adoption of efficiency methods. On the other hand there have been numerous cases in which the adoption of a piece rate resulted in such increase of output that the rate was promptly cut, this process sometimes being repeated until wages were reduced to approximately their former level. Meanwhile the slower persons were discharged. Under such circumstances the worker can hardly be blamed for harboring resentment against piece rates, the industrial management which makes use of them, and efficiency in general. Ac-

cording to Myers [1] there is a growing disposition to resist the adoption of piece rates except on condition that increase of output shall not be followed by rate-cutting, that the less rapid workers shall be guaranteed employment, and that losses due to defects of tools and materials for which the worker is not to blame shall not be charged to him.

Can the two methods of payment be combined so as to secure their advantages jointly, and modified in such a way that their undesirable effects will be eliminated? Various modifications and combinations have been tried, such as maximum and minimum time rates depending on the output, "differential" piece rates which likewise vary according to the amount produced, time rates with superposed bonuses, profit-sharing, and so on. The differential piece rate may be used to lessen the sum paid per piece beyond a certain point, and so discourage undue exertion. This appears somewhat artificial and unjust, however; and perhaps it is inevitable that any mode of payment which involves the piece rate will include in some degree its bad as well as its good features. In any case the rate should be based, if possible, on scientific study of the time and other factors of the process. Bonuses smack of generosity rather than just earnings, and profit-sharing is usually so small as to be negligible as an inducement. Both are likely to incur suspicion of being unduly small, and the fact that they are long deferred further diminishes their effectiveness. Human desire so outruns the possibility of fulfillment that no system

[1] *Mind and Work*, Ch. V.

of payment can be expected to prove perfectly satisfactory. Yet these methods have merit, and may be regarded as helping in some measure to solve the problem of industrial efficiency. Scientifically organized industry makes use of wage methods which have the greatest stimulative force, together with the least nervous and moral strain.

Philanthropic Measures.—Though wages and methods of payment are highly important as factors of efficiency, they must at best be reckoned as only partially effective. The "morale" of the office or shop varies to a considerable extent independently of them. Often the seeds of trouble are to be sought elsewhere, particularly in the worker's feeling of being regarded as a mere tool of production rather than a human personality. Self-respect and that deep desire for personal appreciation which everyone has within him forbid contentment with a status in which one becomes nothing more than a mere cog in a huge industrial machine, perhaps expert in a minute part of a larger process, but with no recognition of worth except in terms of payment for expertness, and condemned to a deadening routine which effectually atrophies whatever finer nature one possesses. Especially if one's work is characterized by an unpleasant environment of noise and grime, or by drudgery and nervous strain, it is only natural to react against it with listless, careless attitudes which spell inefficiency. Still worse where the available supply of workmen is so large that it is cheaper, when one is injured or worn out or no longer needed, simply to throw him away, in spite of the suffering

which this inflicts upon others as well as upon himself. Under such conditions good work can hardly be expected.

In so far as efficiency is inhuman in its demands it cannot permanently endure. Not only must it give way to the humanitarian spirit which increasingly pervades society; in the long run it defeats itself, since it leads to defensive reactions on the part of the worker—deliberate slowness, waste of materials, sham sickness, and so on. If the idea of efficiency is to dominate industry it must be harmonized with the maintenance of human values—with the worker's health, his domestic comfort, his personal happiness, and his moral welfare. His good will is needed quite as much as his technical skill; conscious and subconscious attitudes of responsibility and coöperation are requisite if real efficiency is to be attained. How to secure these conditions is perhaps the most baffling part of the whole problem, but it is certain that they cannot be secured by ignoring the remoter aims and more intangible ideals which help to constitute personality. Many industrial managers have discovered that a rational and sympathetic humanitarianism conduces to production, and that the gain in interest and loyalty ultimately compensates for the expenditure of time and money involved.

A wide variety of projects have found their way into contemporary industry, and in some cases have established themselves firmly there. These include not only the customary vacations, excursions, and picnics, but more novel features such as rest rooms,

club rooms, gymnasiums, baths, hospitals, libraries, entertainments, school instruction, and religious services. Special physicians, teachers, matrons, and social directors extend the tale of philanthropic efforts. The fundamental principle of them all is the same: By relating the work organically to environmental conditions of general comfort or incidental enjoyment the good-will of the individual is obtained, his resentment against disagreeable features of toil is lessened, and his working energy is increased. Other measures of a somewhat different character are the institution of pensions and the provision of appropriate work for those who have grown old or have been partially disabled in service. Such practices likewise carry assurance of personal interest and sympathy, and aim to close the gap between owner and worker which the expansion of modern industry has produced.

Many of these innovations may be regarded as having demonstrated their value, and some have become indispensable. Wisely conducted, they are contributory to the solution of the general problem of establishing industrial efficiency on a moral foundation. They are open to certain criticisms, however, which focus on the fact that they are autocratically imposed and administered. In some instances their suggestion of charity and the rigidity of their arrangements do not square with the worker's feeling of independence. He prefers to take care of himself rather than to be taken care of. In other cases they fail to satisfy him because they appear to be part and parcel of the thing he dislikes—his

disagreeable job. When he is not actually at work he desires to stay away from the shop, not to linger in its shadow, even in a club room or gymnasium. Its entertainments do not give pleasure as do those which he himself chooses. Since his freedom and spontaneity are so thoroughly limited in his daily toil he sets all the more store by whatever measure of them remains untouched in the rest of his life.

Furthermore, philanthropy is easily regarded as an apology for injustice or a bribe to secure subservience. Especially when it takes a religious form it is likely to incur suspicion of being a device to protect arbitrary authority. A religious view of life doubtless helps many persons to do their work well; hence industrial managers commonly desire to have their employees brought under religious influences, and sometimes contribute heavily to evangelistic campaigns for this purpose. But the worker knows that religion has too often gone hand in hand with tyranny, and accordingly suspects ulterior motives behind the effort to spiritualize his life, and reacts against it. Therefore while humanitarianism is a partial solvent of industrial discontent, and is unquestionably valuable as an aid in producing efficiency, its effectiveness is distinctly limited by certain forces of human nature which have their center in the instinct of self-assertion, and which demand satisfaction in other ways.

Systematic Coöperation.—Wage methods and humanitarianism are also inadequate as moral factors of efficiency in that they fail to touch certain points of the internal order of industry where there

is friction. The regulation of hours, distribution of work, and other shop conditions present many problems which cannot be solved satisfactorily without the worker's coöperation. Difficulties arising from rush orders, overtime, irregular supply of materials, the use of tools, and defective work call for harmonious adjustments in which he must have some voluntary part. So long as he is simply a helpless subordinate, compelled to accept another's decisions without question, he is apt to react against these by poor performance. The rankling resentment produced by a foreman's command, which is or appears to be unjust, works out in carelessness and waste; unwelcome conditions arbitrarily imposed by a manager stimulates ingenuity of evasion. If he is to do his best he must share in the control as well as in the proceeds of his employment.

This need has been increased by the mechanization and impersonalization of contemporary industry. The diminished scope and elasticity of the individual's particular job leaves him without much possibility of self-direction in it; hence his natural self-assertiveness, which is profoundly instinctive, demands other opportunities of expression. Unwilling to become a mere tool or machine, he takes such measures as he can to establish his independence and freedom. Another new factor in the problem, and one of even more far-reaching significance, is his deepened conviction that he has a moral right to take part in the direction of industry. The advance of civilization has had the effect of lessening individual submissiveness, of inculcating the view that no

human being has unquestionable authority over others. Furthermore the development of unionism carries with it the assurance that labor has not only the right, but through proper organization the power to regulate conditions of employment. It is this sentiment we must regard as of primary importance in the present situation. While millions of workers are as yet only dimly conscious of it, nevertheless it is spreading widely, and in some highly organized industries has already reached a considerable definiteness of practical form.

The complex problem of allaying industrial discontent and thus increasing efficiency may therefore be regarded as in part one of social psychology. It is a problem, that is to say, of discovering methods of industrial organization which will function with a minimum of inner strain because they satisfy the instinctive demands of human nature in its group forms of industrial activity. The worker must be dealt with not simply as an individual who is to receive a certain wage, or who needs humanitarian aid, but as a member of a group which is conscious of its organized power, and which is capable of efficient coöperation rather than antagonism. The energy which too often takes the pugnacious form of a strike, and the shrewdness which still more prevalently expresses itself in subtle ways of inefficiency, should if possible be directed into constructive channels. How may this be accomplished?

Here as elsewhere the solution of the problem can be found only by wisely directed experiment. Among the devices which have been employed we

may mention the shop committee, which considers and passes judgment on certain questions that are explicitly defined as within its jurisdiction, the shop representative who takes counsel with the management in regard to matters of dispute, and the "impartial chairman" of joint committees of management and workers, whose decisions have final authority. Some large factories have been organized in imitation of political democracy, with a cabinet, senate, and house of representatives. In some instances shop and trade unions have shown themselves capable of coöperative effort in improving efficiency. No single form or organization is to be regarded as exclusively the right one. Probably different types are needed in different industries, and perhaps also in the same industry according to varying conditions. The main requisites for any cooperative scheme are that it shall actually function in the adjustment of disagreements, and that its general character and special decisions shall be respected by the parties to it.

The difficulties in the path of industrial coöperation are not to be ignored, and since they lie to a considerable extent in the nature of the human mind they present interesting practical problems for social psychology to solve. On the one hand we have the conservative conviction of many owners and managers that within the walls of the industry their authority must not be questioned, that when the wage relation is established it is for them to give orders and for their employees to obey. In their view, indeed, loyalty and coöperation mean essen-

tially obedience and hard work. On the other hand it must be acknowledged that the aims of most organized labor are primarily pugnacious; the union exists in order to protect its members and to secure the most favorable working conditions possible. Its principal weapons are the strike and the threat of strike. Too commonly each party distrusts the purposes and honesty of the other; each regards the other as indifferent to any interest except its own, neither fixes its attention upon the right objective—an equitable distribution of the gains resulting from increased efficiency.

These obstacles must be overcome by argument and example. Industry cannot proceed indefinitely with a constant strain of inner antagonism, still less with an alternating régime of tyranny and rebellion. If the railroads, the mines, the steel plants, textile factories, and other huge mechanisms of present-day industry are to function efficiently they must develop the motives and the methods of responsible coöperation. Without these the other moral factors of efficiency, including loyalty and "the spirit of the game," are insufficient or impossible.

It is expressly to be noted that the principle of cooperation does not signify in the mind of the worker an approach to either communism, or socialism, or even his participation in the business management of industry. Investigation has shown, in fact, that he is not particularly interested in its financial aspects; generally speaking, he knows that neither he nor his representatives are competent to deal with its financial problems. What he wants is a living

wage, hours of labor which leave sufficient time for the enjoyment of life in his home and elsewhere, and a voice in the regulation of the more immediate conditions of his work.

QUESTIONS AND EXERCISES

1. What sources of discontent are found in the internal organization of contemporary industry? Why does the adoption of efficiency methods tend to increase this discontent?

2. Show how the change of social conditions in industry has contributed to this discontent. What general development of contemporary social consciousness has intensified it?

3. How does industrial discontent express itself in relation to work?

4. What are the advantages and disadvantages, as seen from a psychological standpoint, of the time-rate method of payment?

5. What is the relation of the piece-rate to efficiency? Show how it sometimes leads to injustice and resulting discontent.

6. How may the two methods be combined so as to increase efficiency? What value have bonuses and profit-sharing in the motivation of efficiency?

7. What is meant by "philanthropic measures" in connection with industry? What are the principal ones?

8. Show how such measures tend to promote efficiency. In what respects are they unsatisfactory?

9. What internal conditions of industry call for the systematic coöperation of workers in management? Show how these conditions are related to efficiency.

10. What experiments in systematic coöperation have been tried? What conditions are requisite for successful coöperation?

11. Show how the developing social consciousness of labor

is related to these problems and experiments. How is this consciousness related to socialism and communism?

12. Show the part played by instincts and imitative tendencies in relation to the social and moral problems of industry.

CHAPTER XX

ADVERTISING AND SALESMANSHIP

Psychological Principles of Advertising.—The various operations included in the marketing of products—advertising and display, sale and delivery—involve mental processes in so essential a way as to constitute a distinctly important field for the application of psychology. The mind of the customer, with its general and special interests, must be reached by stimuli which will produce desire and the action of purchase. Goods must be presented in such a manner as to catch attention and win approval; the salesman must know how to overcome the customer's inhibitions. Articles should be delivered in a fashion which suggests personal consideration and enhances the satisfaction of attainment. All this has of course long been recognized in a general way. Mercantile business has always been characterized by shrewd understanding of the mental processes of the buyer. Here, as elsewhere, psychology can only extend wisdom and refine common sense along lines already somewhat familiar.

Within the last twenty years there has been a remarkable development in this field, beginning with the scientific investigation of the psychology of advertising. Following the pioneer work of Scott,

numerous students of the subject have elaborated its technique, thus giving rise to the profession of "advertising expert," and resulting in extensive changes of practice. There are two principal reasons why this subject was the first to be studied technically. First, the universal prevalence and enormous extent of advertising constitute an economic problem of the greatest importance. The expenditure runs annually into billions. Yet the traditional methods are haphazard and uncertain, conspicuous successes being counterbalanced by expensive failures. When a single-page advertisement in a magazine costs thousands of dollars, and a country-wide campaign hundreds of thousands, it is imperative to make so huge an outlay as effective as possible, and accordingly the services of the psychologist are requisite in order to insure results. His analytic methods of investigation have a certainty not otherwise obtainable. Secondly, advertising is more easily studied than are other parts of the industrial order. Since it aims to reach large numbers of persons, whose individual peculiarities may largely be ignored, it has a relative simplicity. The complex problems of personal reaction, such as belong to salesmanship, do not present themselves. Statistical data are conveniently available. The principal method, namely printing, is easily applied and varied to suit experimental purposes; and its results are often susceptible of exact measurement, as for example the number of persons reached by a particular advertisement who proceed to purchase or to make inquiry about the goods. Furthermore,

the alteration of practice is not hindered by the existence of tools, machines, and equipment, change of which would be forbiddingly expensive.

In brief, the psychology of advertising has to do with the mechanisms of human motivation which operate through the will, but it does not give special consideration to the intricacies of individuality. Its fundamental principles may be stated very simply. In the first place *an advertisement should be so constructed and placed as to catch and hold attention.* Generally speaking we do not approach it with an initial purpose which leads us to investigate it voluntarily; observation of it is usually a rather casual experience—turning the pages of a magazine, passing a billboard, glancing at an electric sign. Second, *it must fix itself in memory.* Inasmuch as there is ordinarily a considerable interval before the observer purchases the advertised article, its name and character must be lodged so deeply in the mind that the associative mechanism will later bring them to consciousness when they are needed. Third, *it must have the force of suggestion in stimulating desire and leading to purchase.* In order to be effective it must touch off some determining tendency of action, some instinct, emotion, interest, or habit. To use the current term, it must have "appeal." The general problem of the psychology of advertising is therefore, How should advertisements be constructed and used so that they will stimulate most effectively the mental functions of attention, memory, and decision?

In respect to both advertising and salesmanship

we must recognize the fact that there are several kinds of buyer, the cautious and the incautious, the ones who know just what they want and those whose desires are more vague. Most persons have "buying habits"; some regularly prefer what is familiar, while others are more accessible to novelty. Local and national traits are likewise occasionally important. These differences constitute classes which must be approached in quite different ways, and accordingly the rules which apply in one case fail in others. A thorough psychological discussion of the subject would of course give these classes explicit consideration; in fact they offer numerous opportunities for experimental and statistical treatment. The brief account contained in the following pages must ignore them for the most part. We may do this the more safely, however, because in any case special rules depend upon the fundamental principles indicated in the preceding paragraph. The psychology of advertising is always concerned with attention, memory, and desire; it always seeks to determine the conscious and subconscious means of stimulating the reaction of purchase.

The problems of the subject fall into several distinct groups according as they relate to (1) the nature of the appeal, (2) internal details such as the use of pictures, colors, and styles of type, (3) size, repetition, and position, (4) the various media, as newspapers, periodical magazines, street-railway placards, billboards, and so on. To some extent these problems may be dealt with deductively in the light of known laws of the mind's operation,

for example in the use of large type and striking pictures. In some cases they may be brought into the laboratory and investigated by experimental methods, as in the measured comparison of two advertisements in point of attention value. Statistics are also occasionally useful in ascertaining degrees of effectiveness.

Advertising offers especially good illustrations of the general principle that the same psychological methods may be employed for purposes which are good and for those which are bad. Patent medicines and worthless oil wells are widely sold by skilful appeals to the desire for health or to cupidity. This sad fact does not imply that we should refrain from developing as thoroughly as possible the psychological technique of effective advertising. Rather does it emphasize the necessity of enlightening the public as well as the advertiser as to the exact character of the methods used, so that on occasion the buyer will be properly on his guard.

The Appeal.—The most important feature of an advertisement is its *appeal.* Its ultimate purpose is to lead persons to buy, and in order to do this it mush touch some interest which serves as a motive. The inclination to purchase must be aroused in the mind, and energized so that it overcomes inhibitions, by bringing to bear on the matter some inner tendency which possesses habitual or emotional force. Adams gives a list of fifty kinds of appeal which are more or less frequently found in advertisements.[1] Especially effective are such characteristics as cheap-

[1] Adams, *Advertising and Its Mental Laws,* p. 141 f.

ness, usefulness, durability, reliability, safety, elegance, and the like. The traits of the prospective purchaser may also be explicitly emphasized—his economy, discrimination, affection for his family, illness or health. Since our desires rest at bottom upon instincts, those inherited tendencies which make for self-assertion, self-protection, possession, and various social relationships which are characteristic of human life, it is important to make the picture or text of an advertisement touch these powerful springs of action. Since, too, we have learned from experience to proceed cautiously in pecuniary matters, and constantly carry with us a set of inhibitory tendencies and ideas such as "don't really need it," "can get along without it," "may prove unsatisfactory," and "better wait a while," advertisements often address themselves expressly to these restraints.

Certain classes of articles have their special form of appeal. Thus food advertisements frequently emphasize the qualities of purity, cleanliness of preparation, and healthfulness. Furniture is represented as comfortable, durable, and elegant. Clothing is fashionable. Automobiles must be reliable or economical; they also appeal to the love of recreation, and to traits of sociability. Banks and investment houses speak of financial security and future comfort. Railroads and steamship lines have speed and safety, or address themselves to the love of travel and the esthetic appreciation of scenery. Often the forms of appeal used in advertising one kind of commodity would be quite useless for others.

The appeal sometimes owes its character to the sex, occupation, or cultural interest of those to whom it is directed. Cosmetics and jewelry are for women, tobacco and sporting implements for men; the desire for personal beauty and display operates as strongly in one sex as do the instincts of hunting and competition and the imitative habit of narcotic stimulation in the other. Professional equipment is properly advertised in ways which may be wholly uninteresting or even unintelligible to the general public; similarly with the tools of the machinist, and innumerable kinds of occupational supplies. Different social classes likewise have their characteristic desires and points of view. Expensive luxuries appeal to one set, art and literature to another. While almost everything is represented as cheap, this desirable feature may well give way to the suggestion of elegance or exclusiveness in aiming at a certain class of buyers. The interests of youth and of maturity are somewhat diverse. Not only the special qualities of the article, but the character of the user also, must be considered with care in the construction of an advertisement.

Imitative beings that we are, we not infrequently have our desires brought to the point of purchase by the example of our associates. The declaration, "Others are using this. Why don't you?" acts powerfully to bring us into line. Similarly the information that orders for an article are being received faster than they can be filled, or that there are seven hundred thousand owners of a particular make of automobile, serves to add many more to the list.

The reputation of being commonly bought constitutes in itself an exceedingly effective appeal. The effect is not produced by mere assertion, however; we must have grounds for believing that the latter is true. But where such belief exists together with an independent desire for the article in question, it greatly increases the intensity of this desire. Furthermore our acceptance of it may be subconscious. The appearance of the same advertisements in different newspapers and magazines and in successive issues, the huge billboards which confront us everywhere, the nation-wide advertising campaigns, all give us, in addition to the mechanical effect of repetition, a subtle assurance of the widespread and continued acceptability of the goods, and so justify their huge expense by still huger returns of patronage.

It must be understood, of course, that the foregoing statements do not apply to certain large classes of advertisement in which there is no attempt at appeal. Some of these merely give a few words of information, others the name of a firm, or of a commodity. In such cases the purpose is simply to offer needed directions, or to fix the name still more deeply in the public mind, so that on occasion the prospective buyer will think of it. The appeal is presumed to be unnecessary, or is presented elsewhere. Perhaps most of the advertisements which we meet are of this limited character. It remains true, however, that where the aim is that of stimulating desire it must address itself to some instinctive or acquired interest of human nature.

Content and Form.—A second group of problems relates to the manifold internal details of advertisements, such as the use of illustrative photographs or drawings, the arrangement of picture and printed words, the effectiveness of different colors and styles of type, literary forms of presentation, and so on. These details are significant not only with respect to attention and memory; they also help to reenforce the appeal. Let us observe briefly some of the more important points which have been discovered or confirmed by psychological study.

Pictures are all but indispensable in advertising innumerable articles of use or beauty. We depend so constantly upon our eyes for evaluating things that we often have to get a preliminary view before we even consider purchase. The pictorial appearance attracts us much more forcefully than does a description. For this purpose photographs are usually better than drawings, though sketches of imaginary interiors, domestic scenes, and dramatic occurrences, in fact the artistic representation of any experience which is appropriate and has a pleasurable tone, may be effective. It is to be especially noted that the picture should be appropriate. Inappropriate pictures, no matter how artistic or pleasing, have comparatively little value. Most effective, of course, are those which present the appearance of the article, the act of purchase, and its use. The picture should also have a positive and agreeable suggestion. The indication of what to avoid does not work so well as that of what to do or to obtain. Representations of possession and of use

should depict satisfaction. In this respect the suggestive force of a smile is particularly noteworthy; advertising pages sometimes confront us with a procession of smiling faces of gratified owners and users. Pretty feminine faces and the joy of children seem to be especially ingratiating.

Color may be used to advantage, especially in pictures, where it is more pleasing than black and white. The recent developments of color printing have resulted in beautiful pictorial advertisements, the artistic richness of which considerably enhances their appeal. Individual color preferences vary; yet in a general way certain hues, tints, degrees of saturation, and forms of harmony and contrast have superior affective value.[1] Colored letters, however, are less easily perceived than the ordinary black ones, and hence have a slightly diminished effect in holding the attention. Except for the sake of novelty or color harmony the tinted letter is therefore objectionable, as is also the use of white letters on a dark background.

The *arrangement of details* is a complex matter involving various esthetic, geometrical, and even logical principles. Points to be considered are the relative size and position of the picture and reading matter so that neither tends to obscure the other, the relation of filled and open spaces, different styles of type, lengths of line, logical sequence of features, and cumulative effect. Generally speaking, the picture should be placed where it will catch the eye at the outset, the whole space should not be so crowded

[1] Adams, *Advertising and Its Mental Laws*, pp. 250-267.

as to give the appearance of confusion, important assertions should be in large type, the beginning and the conclusion should present essential details, pointedly phrased—the name of the article or of the firm, the place where it is to be found, the need of prompt action, and the like. Well arranged advertisements sometimes include a large amount of reading matter in fine print, which may be ignored without missing the main characteristics of the article, but which contains further information for those who desire it.

The *literary form of the text* is psychologically significant. Some articles need only description, and perhaps only a few words of that. Others, by reason of their novelty or of competition, require argument. Extensive logical reasoning is usually out of place in advertisements, since the reader's state of mind is not that of wanting to have something proved; he can judge more briefly for himself, and he wants to get on. Where the article is extraordinarily expensive, or possesses subtle technical merits, it may sometimes be assumed that he is sufficiently thoughtful to be impressed by argument. In bank advertising, for example, statistical information and inference from it may be represented with rational effectiveness. The preëminent value of short, emphatic assertions, typed in striking form, hardly needs comment. Most important of all is the catchword, crisp phrase, or pointed sentence which cleverly suggests the desirability of the thing—"57 Varieties," "The Ham what *Am*," "Let the Gold Dust Twins Do Your Work," "You Press the But-

ton; We Do the Rest." Such suggestions, hammered with constant repetition into the minds of hundreds of thousands of persons, have almost irresistible effect. Commands are likely to arouse instinctive opposition, and hence should be avoided; the courteous, ingratiating form of address accomplishes better results.

It should be observed that these details of content and form owe their importance partly to their subconscious effect. We do not usually stop to reflect on the points of superiority or inferiority which characterize an advertisement; in fact we may hardly notice them. Yet they are producing an affective tone of pleasure or displeasure in the mental state which thereafter is attached by simultaneous association to the thing advertised, and later may even determine whether we purchase it or refrain from doing so. In this connection we should note the peculiar psychological significance of the "trade name," such as "Ivory Soap," "Sun-Maid" raisins, "Eversharp" pencils, "Hotpoint" electrical implements, and the like. These names often have a subtle suggestiveness which greatly increases their sale, hence the names of highly popular articles are sometimes closely imitated with the purpose of deceiving the buyer, and not infrequently there are resulting lawsuits to determine whether there has or has not been infringement of copyright. Decisions in these cases express the personal opinion of the judges, and have little apparent consistency. Thus "Non-X-Ell" was called an infringement of "Noxall," though "Pinozyme" did not infringe "Pep-

tenzyme." Paynter conducted an experiment to determine the extent to which the public was actually confused by such resemblances, and obtained results which were conspicuously at variance with the legal decisions. "Pinozyme" and "Peptenzyme," for example, were confused fifty per cent more than "Non-X-Ell" and "Nox-all." [1] We may say with some assurance that in such cases the decision should be based at least in part on psychological evidence.

Size, Repetition, Position.—An important group of problems has reference to the comparative effectiveness of different sizes of advertisements, of size and frequent repetition, of different positions on the page, and of varying environment or context. Formerly these differences were largely ignored. Psychologists showed, however, that the attention value and memory value of advertisements vary widely in relation to these conditions, and that certain combinations of them have much greater effectiveness than others. The method of investigation was as follows: Booklets of advertisements were compiled in such a way as to exhibit a variety of sizes, number of insertions, and page positions. These were submitted to subjects who looked at them as one ordinarily runs through the advertising sections of a magazine, but turning the pages at regular intervals, so that every one received the same duration of attention. The subjects then reported what they remembered of the contents. This method, as employed by Scott and others, gave valuable results. Starch used "nonsense syllables" instead of real

[1] Hollingworth and Poffenberger, *Applied Psychology*, p. 237.

advertisements, thus eliminating the factors of personal interest and familiarity, and reducing the process of attention and memory to a simpler and more significant form.

Scott showed conclusively that the larger advertisements are not only more effective than the smaller ones, but that the ratio of their effectiveness is greater than that of their size. The full page advertisement has considerably more than four times as much impressiveness as does the quarter page. The eighth page is only about a twentieth as effective as the full page, and so on. Hence the larger advertisements, even the double page, may be regarded as most economical. Münsterberg found, however, that the advantage of size might be more than offset by repetition—that the quarter page repeated four times had one and one-half times stronger memory value than a single insertion of a full page, and was superior also to the twice repeated half page, but that the advantage of repetition did not grow with a further reduction of size. Adams, by more complicated experiments which reproduced as nearly as possible the actual conditions of advertisement reading, found that the once shown full page and the eight times repeated eighth page had the greatest value. The discrepancy between these results is presumably due to irrelevant factors in the character of the advertisement or of the reader. The general principle to be borne in mind is that the psychological laws of the effect of intensity and summation of stimuli imply the superior value of certain combinations of size and repetition.

The placing of advertisements has also been investigated experimentally. That the outside and inside cover pages are most desirable because most likely to be seen is obvious. The most favorable position of part-page advertisements offers a more complicated problem, in which our reading habit of beginning at the upper left-hand corner of the page is a determining factor. Adams found, as might be expected, that the top of the page has the greatest attention value, the middle next, and the bottom least. The left side has greater attention value than the right, but this may be offset by the fact that in turning the pages the right side comes first into view, hence in general the outside of the page is more likely to be perceived than the inside. The right-hand page is more valuable than the left.[1] Of course if the attention value of the content of the differently placed advertisements is not approximately the same, these conclusions do not necessarily hold. A poorly situated picture may be more effective than more favorably placed print.

The fact that advertisements which are buried in the inner pages of advertising sections are much less likely to be seen has long led to the practice of mixing them with other reading matter, on the supposition that the reader will thus inevitably have his attention called to them. Probably this is true in some measure, especially since many advertisements would never be seen by numerous readers under other conditions. The value of the practice remains somewhat doubtful, however. Münster-

[1] *Advertising and Its Mental Laws*, p. 101.

berg points out that the mental attitude toward the two kinds of object, story or essay and advertisement, is quite different, and that there is a degree of irritation in the attempted distraction of attention from the former. He holds on the basis of experiment that the advertisement loses rather than gains by proximity to other reading matter. Scott's extensive questionnaire addressed to advertisers and advertising agencies produced much conflicting opinion but little evidence. It has been half humorously suggested that there should be a subtle agreement between the two; for example stories of out-door life and adventure should lead to advertisements of sporting implements, literary essays to those of books, and so on.

Advertising Media.—Our final group of problems relates to the various media of advertising. What are the advantages and disadvantages of newspapers, magazines, handbills, circulars, pamphlets, and catalogues, street-railway cards, billboards, electric signs, theater and concert programs? There has been some questionnaire investigation in this field, but as yet applied psychology, except of the common sense and untechnical sort, has little to say. The newspaper has the desirable features of large circulation and frequent repetition. It also permits great variety of size and internal form of advertisement. By securing quick response and thus facilitating local distribution of goods it lends itself favorably to the advertising of such commodities as clothing, food, and furniture. Public amusements find here an effective means of reaching the attention of the

multitude. Since it is usually read hastily its advertisements are constructed so as to catch the attention, and present information with brevity and point; large type and striking pictures serve the purpose. It is regularly used, too, by many readers whose definite aims make such devices unnecessary; hence the pages of want and real estate advertisements in small type. It is interesting to observe that one kind of advertisement which is very profitable pecuniarily, namely that of quack medicine and surgery, is disappearing from the better newspapers, partly because it is morally objectionable, partly because it tends to cast discredit upon the paper in which it appears.

Magazines share some of the advantages of newspapers, and obtain a more leisurely reading. They also reach certain classes of readers, and have a more widely distributed circulation. To some extent the name and standing of the periodical are understood to constitute an endorsement of the advertisements which appear in its pages. The various types of advertising circular, pamphlet, and catalogue, as those of publishing and mail order houses, have the special advantage that they may be sent to persons who are presumably interested in the goods, and thus avoid much waste of distribution. Their personal form of address has some strength of appeal. A circular recommending opportunities for investment, for example, may receive attention though the same advertisement published in a newspaper or magazine would pass unnoticed. On the whole, however, the relative value of newspapers and other

media as advertising agencies is unknown, except by shrewd guesswork and subsequent results.

Street-railway advertising is effective, as Scott has pointed out, because the passenger is ordinarily at leisure and his mind is comparatively blank, which condition renders him especially suggestible. If he has no other occupation he reads and rereads the placards until their content is lodged in his mind. He forgets the experience, but not the advertised article, and later the impression which it has thus casually produced may determine his decision to buy. Since the suggestion is given to large numbers of persons, and is repeated from day to day, this form of advertising is especially effective. Billboards and electric signs also present themselves to the multitude, and have the impressiveness of size and brilliancy. Electrical devices sometimes create an illusion of motion which naturally attracts the attention. This kind of advertisement usually receives only a passing glance, however, hence it says but little, and is valuable chiefly to keep commodity names in mind. Such things as foods, beverages, chewing gum, and tobacco attain and hold their popularity in this way. The highway billboard seems to be a peculiarly appropriate medium for automobile advertisements. Placed on city streets it notifies the passing throng of theatrical plays, concerts, and other amusements which need no elaborate exposition. In all these cases, it will be found, the medium and form of advertising have definite relation to the character and purposes of the observer.

The Psychology of Salesmanship.—The psychological problems presented by salesmanship are much more difficult than those of advertising. This is due to the fact that buying and selling usually constitute a peculiarly individual relation, involving the complexity, obscurity, and uncertainty of individual character. Methods of approach, of overcoming inhibitions and inducing purchase depend so essentially upon personal conditions that laboratory experiment is practically out of the question. Native intuition and acquired tact, special knowledge of the goods, intelligent study of customers and their needs, energy, persistence, confidence, cheerfulness and courtesy—in short what we have called the "psychology of common sense"—constitute the rules which effectively govern the process. But these rules are so broad and need so much qualification when applied to actual situations that they hardly permit exact statement. Efficiency may be stimulated by the familiar methods of imitation and rivalry by the inculcation of ideals and the offer of special rewards, but here again it is impossible to formulate a precise technique.

Nevertheless certain psychological principles are instructive. In the first place salesmanship is largely a process of suggestion, hence the proper procedure is that of putting the prospective customer in the right preliminary state of mind and then driving in the idea of purchase. It is traditionally a part of the art of the traveling salesman to induce suggestibility by smooth address, friendly personal inquiries, humorous stories, and the like. Similarly

in dealing with visiting buyers, expensive entertainment sometimes serves the purpose of smoothing the mental pathway for subsequent attack. For good reasons these practices have largely given way to more direct methods of approach; yet it remains true that the customer's favorable decision is obtained more easily if it is sought in the right mental atmosphere. Common sympathies in politics and religion sometimes increase suggestibility. One who plays golf is more likely to buy from a brother golfer, even though the goods have nothing to do with the game. Obtrusive manners and undue familiarity produce a mental tone of dislike which naturally attaches itself to the articles under consideration. Courtesy is universally requisite.

Before the suggestion of purchase can become effective it is often necessary to overcome general and special inhibitions due to caution or to more explicit reasons. Here the factors of success are numerous and varied—clear description or inviting display of the goods, accurate knowledge of their details, good natured persistence and repetition of attack, turns of speech and of behavior which express confidence, and so on. Especially effective is the ability to state clearly the peculiar merits of the article on sale. The best salesman is one who possesses thorough familiarity with what he is selling, and uses this knowledge courteously for the benefit of the purchaser.

Four points of special importance are the following: (1) In approaching a customer, assume but do not try to force his interest. If calling on him, do

not acknowledge even as a polite conventionality that he may have more weighty business in hand; for he may accept the suggestion, and in any case it is likely to strengthen an unfavorable attitude. The salesman must steer his course between this error and the opposite one of excessive display of zeal which invites distrust. (2) Concentrate the customer's attention. Do not distract it by continual talk or display of other articles. Stick to one thing until there is reason for change. If the choice lies between several, try to keep that one in the foreground which seems to be nearest his needs or his desire. It is a psychological truth that so long as his attention is flickering from one point to another he simply cannot reach a decision. (3) Spend more time in presenting positive merits than in answering objections. The negative effect of an objection often remains after it has been rationally met; hence it is better to keep attention upon desirable features as much as possible. This tends automatically to suppress the objections. (4) Watch for the "psychological moment," and then *move the point.* When the resistance breaks down, as may be indicated by a word of acquiescence, momentary silence, or a mere change of facial expression, clinch the sale by speaking or acting as though it were actually being made,—presenting the contract for signature, proposing to send the goods at once, or using any similarly suggestive device.

The art of the salesman varies in relation to several different factors of the problem. The buyer who knows precisely what he wants and the one who has

only a vague idea must be dealt with in different ways. In the former case the aim is to convince him that the article really fulfills his requirements; in the latter, it is to arouse interest and give needed information, hence the sales talk assumes a more diversified form. So, too, the customer's general character, personal tastes, and pecuniary limitations call for judicious modifications of method,—information as contrasted with advice, emphasis upon this or that quality of the goods, recommendation of their cheapness and durability or stylishness and elegance, and so on. Psychology cannot give exact rules for this art though it can give an insight into the nature of the mind which tends to produce effective address and to prevent blunders. Expertness consists in grasping conditions quickly and suiting the talk and display to the requirements of the situation. Hence while correct methods may be learned by instruction, they also depend in some degree upon original ability. There are "born salesmen," and also persons who lack the native adaptability of mind which is requisite for success. It occasionally happens, too, that individuals who fail in selling one kind of goods succeed with another, primarily because they are interested in the latter and therefore spontaneously hit upon better ways of presenting them.

The methods of skilful salesmanship may be regarded psychologically as mechanisms which serve, partly by subconscious suggestion, to induce purchase. Like the mechanisms of applied psychology in other fields they are instrumental to purposes which may be wise or unwise, and good or bad in

point of moral character. They may be employed to sell worthless goods or to compel a customer to take what he does not really want just as genuinely as to afford satisfaction. The value of the ends to be attained is a distinctly different consideration. Yet here again it must be acknowledged that in the long run the effectiveness of the means depends upon the worth of the aims. Tricky salesmanship ultimately wins distrust. The salesmanship which retains its power is that which uses its skill for sound purposes.

QUESTIONS AND EXERCISES

1. Take two or three current newspapers and magazines, and analyze their advertisements according to the contents of the chapter.

2. What mental functions are of fundamental importance for consideration in advertising? What are the principal groups of problems?

3. What is the "appeal" of an advertisement? What are the most effective kinds of appeal in advertising to the general public?

4. Show that special forms of appeal may be used for special classes or articles. Mention some forms which are especially effective with certain classes of buyers.

5. Show how the appeal of an advertisement is reënforced by social imitation.

6. What kinds of pictures are most effective in advertising? Mention some pictures which are identified in your mind with the articles they advertise.

7. State several points concerning the use of color in advertising. Name some articles in the advertising of which color is especially appropriate.

8. State several principles of the arrangement of details in an advertisement. Find some advertisement which is especially well arranged, and explain psychologically why this is the case.

9. What is the value of argument in an advertisement? What verbal forms of presentation are usually most effective?

10. Show clearly, using illustrations, that advertisements often owe their effectiveness to suggestion.

11. Describe and explain the character of patent medicine advertisements.

12. Pick out some common characteristics of automobile advertisements and explain why these are used.

13. What features should be accentuated in the advertisement of musical instruments, and how should this be done?

14. Explain psychologically why trade names are frequently imitated. How may applied psychology assist legal decision cases of suit for damages by infringement of copyright?

15. How is it shown experimentally that large advertisements have an effectiveness disproportionate to their size?

16. What is the relation of size to repetition in point of effectiveness? Give illustrations of advertisements which owe their effectiveness partly to constant repetition.

17. State several points about the position of part-page advertisements in newspapers and magazines. Explain these points.

18. Show how the context or environment of an advertisement may affect it. Name two kinds of articles the advertisements of which ought not to be placed next to each other.

19. What are the psychological reasons for and against mixing advertisements and reading matter?

20. What is the general psychological problem in the selection of advertising media? Mention some special advantage of each of the principal media.

21. Compare psychologically the purposes and advantages of street-railway advertisements and the advertising circular sent by mail.

22. Why are the problems of salesmanship especially difficult for technical psychology? Distinguish between different classes of buyer.

23. Explain the assertion that salesmanship is a process of suggestion as much as of argument.

24. Enumerate some important points of procedure in salesmanship, and explain their psychological basis.

25. Show the difference between the psychological and the ethical problems of salesmanship. Are the two purposes absolutely independent?

APPENDIX

A SELECTED LIST OF BOOKS ON APPLIED PSYCHOLOGY

The following list of books includes (a) standard works in different departments of the subject, (b) representative expositions of the methods of psychoanalysis and mental measurement which are playing the leading parts in the development of applied psychology, and (c) certain distinctly popular writings, based on psychological principles, which have proved helpful to many readers.

PART I

AIMS, PRINCIPLES, AND METHODS

BAUDOUIN, *Suggestion and Autosuggestion,* Dodd, Mead, and Co.

BRAMWELL, *Hypnotism, Its History, Practice, and Theory,* Lippincott.

BRILL, *Fundamental Conceptions of Psychoanalysis,* Harcourt, Brace, and Howe.

CORIAT, *Abnormal Psychology,* Moffatt, Yard, and Co.

What is Psychoanalysis? Little, Brown, and Co.

DUNLAP, *Mysticism, Freudianism, and Scientific Psychology,* C. V. Mosby Co.

FREUD, *General Introduction to Psychoanalysis,* Boni and Liveright.

Psychopathology of Everyday Life, Macmillan.

HOLLINGWORTH AND POFFENBERGER, *Applied Psychology,* Appleton.

MOLL, *Hypnotism,* Scribners.

MÜNSTERBERG, *On the Witness Stand,* Doubleday, Page, and Co.

Psychology, General and Applied, Appleton.

MÜNSTERBERG AND OTHERS, *Subconscious Phenomena,* Badger.

SIDIS, *Psychology of Suggestion,* Appleton.

TERMAN, *The Measurement of Intelligence,* Houghton Mifflin Co.

TRABUE AND STOCKBRIDGE, *Measure Your Mind,* Doubleday, Page, and Co.

TRIDON, *Psychoanalysis, Its History, Theory, and Practice,* Huebsch.

WHIPPLE, *Manual of Mental and Physical Tests,* Warwick and York.

YERKES, HARDWICK, AND BRIDGES, *A Point Scale for Measuring Mental Ability,* Warwick and York.

YOAKUM AND YERKES, *Army Mental Tests,* Henry Holt and Co.

PART II

EDUCATION AND EVERYDAY LIFE

ADAMS, *Making the Most of One's Mind,* Hodder and Stoughton.

ALEXANDER, *Man's Supreme Inheritance,* E. P. Dutton and Co.

CALL, *Power through Repose,* Little, Brown, and Co.

COLVIN, *The Learning Process,* Macmillan.

GODDARD, *Feeble Mindedness, Its Cause and Consequences,* Macmillan.

GULICK, *Mind and Work,* Doubleday, Page, and Co.

HOLLINGWORTH, *Psychology of Subnormal Children,* Macmillan.

JAMES, *Talks to Teachers on Psychology: and to Students on Some of Life's Ideals,* Henry Holt and Co.

MCCALL, *How to Measure in Education,* Macmillan.

MCMURRY, *How to Study,* Houghton Mifflin Co.

MINER, *Delinquency and Deficiency,* Warwick and York.
MÜNSTERBERG, *Psychology and the Teacher,* Appleton.
NORSWORTHY AND WHITLEY, *Psychology of Childhood,* Macmillan.
STARCH, *Educational Psychology,* Macmillan.
SWIFT, *Mind in the Making,* Scribners.
Psychology and the Day's Work, Scribners.
THORNDIKE, *Educational Psychology, Briefer Course,* Warwick and York.
WHITE, *Mechanisms of Character Formation,* Macmillan.

PART III

MIND AND HEALTH

BRAMWELL, *Hypnotism and Treatment by Suggestion,* Funk and Wagnalls.
BRUCE, *Scientific Mental Healing,* Little, Brown, and Co.
CALL, *Nerves and Common Sense,* Little, Brown, and Co.
COUÉ, *Self Mastery through Conscious Autosuggestion,* Am. Library Service.
CUTTEN, *Three Thousand Years of Mental Healing,* Scribners.
DU BOIS, *Psychic Treatment of Nervous Disorders,* Funk and Wagnalls.
HOLLINGWORTH, *Psychology of Functional Neuroses,* Appleton.
JACKSON AND SALISBURY, *Outwitting Our Nerves,* Century.
JANET, *Major Symptoms of Hysteria,* Macmillan.
MÜNSTERBERG, *Psychotherapy,* Moffatt, Yard, and Co.
PRINCE AND OTHERS, *Psychotherapeutics,* Badger.
QUACKENBOS, *Hypnotic Therapeutics,* Harpers.
SCHOFIELD, *Force of Mind,* Funk and Wagnalls.
WEAVER, *Mind and Health,* Macmillan.
WORCESTER, MCCOMB AND CORIAT, *Religion and Medicine,* Moffatt, Yard, and Co.

PART IV

INDUSTRY AND COMMERCE

ADAMS, *Advertising and Its Mental Laws*, Macmillan.
CHARTERS, *How to Sell at Retail*, Houghton Mifflin Co.
DREVER, *Psychology of Industry*, E. P. Dutton and Co.
GILBRETH, *Fatigue Study*, Macmillan.
Psychology of Management, Macmillan.
HOLLINGWORTH, *Vocational Selection*, Appleton.
Advertising and Selling, Appleton.
IVEY, *Elements of Retail Salesmanship*, Macmillan.
KITSON, *The Mind of the Buyer*, Macmillan.
LINK, *Employment Psychology*, Macmillan.
MÜNSTERBERG, *Psychology and Industrial Efficiency*, Houghton Mifflin Co.
MYERS, *Mind and Work*, Putnam.
SCOTT, *Increasing Human Efficiency in Business*, Macmillan.
Psychology of Advertising, Small, Maynard, and Co.
TAYLOR, *Principles of Scientific Management*, Harpers.
TEAD, *Instincts in Industry*, Houghton Mifflin Co.

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